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?I would crush his head:? Predicting young children's physical and ...

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**“I Would Crush His Head:” Predicting Young Children’s Physical and Relational
Aggression from Their Social-Information Processing, Affective-Perspective Taking and
Language Skills**

Sara O’Neil

**A Thesis
Submitted to the Faculty of Graduate Studies
Through the Department of Psychology
In Partial Fulfillment of the Requirements for
the Degree of Master of Arts at the
University of Windsor**

Windsor, Ontario, Canada

2008

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ABSTRACT

The correlates and predictors of physical and relational aggression in 50 young children (ages 3 to 6) were examined. Specifically, the links between aggression and social-information processing, affective-perspective taking, and language skill were explored. Social-information processing skills were assessed by presenting children with ambiguous situations and asking them to infer the intent of the character in the story and to say what they would do if they were in that situation. Physical aggression was positively linked to hostile attributions for ambiguous physical situations and aggressive responses to ambiguous situations and was negatively linked with pragmatic language skills. Relational aggression was linked with affective-perspective taking skills and with choosing to involve an adult in an ambiguous situation. Affective-perspective taking was found to play an important mediating role in the links between age, social-information processing, and aggression. Theoretical and clinical implications are discussed and suggestions for future research are made.

DEDICATION

To all of the little children who gave up their time to share some of their lives with us and who filled my days with smiles, laughs, and inspiration.

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CHAPTER 1

INTRODUCTION

“I Would Crush His Head:” Predicting Preschoolers’ Physical and Relational Aggression from Their Social-Information Processing, Affective-perspective taking Ability, and Language Skills

It is difficult not to notice the alarming newspaper headlines about cruel childhood bullying, the aggressive criminals on television that seem to be getting younger and younger, and the New York Times best sellers and blockbuster movies showcasing the newest varieties of children’s aggression. Perhaps even more alarming, though, is the fact that the scientific literature has substantiated the problem and childhood bullying is now considered a world-wide crisis (Carney & Merrell, 2001; Craig & Harel, 2004; Due et al., 2005; Feder, 2007; National Institute of Child Health and Human Development, 2001). In Canada, about 26% of children in Grades 1 to 3 and about 17% in Grades 4 to 8 admit to being victims of aggression (Craig & Harel, 2004; Pepler & Craig, 1997). Actually, direct observation has suggested that aggressive acts occur every 7 minutes on Canadian playgrounds (Pepler & Craig, 1997). When a young man hangs himself after being taunted repeatedly by peers (Bloxham, 2008) or a child stabs another over something as simple as Pokemon cards (CNN News, 2007), certain questions tend to run through our minds. What happened to these children? How did they become this way? Why did nobody do something sooner? The current study aims to explore the nature of aggression and its correlates in young children in an attempt to begin to answer these questions. This

study aims to discover what it is that makes some children choose more often to hurt their peers, physically and emotionally, while others choose prosocial pathways to success.

If something is to be done to correct the aggression crisis, it needs to be done sooner, rather than later. There is a plethora of research to document the existence of aggression among preschool children (e.g., Bonica, Arnold, Fisher, Zeljo, & Yershova, 2003; Casas et al., 2006; Crick, Casas, & Mosher, 1997; Crick, Casas, & Ku, 1999, Crick, Ostrov, Burr, Cullerton-Sen, Jansen-Yeh, & Ralson, 2006, Hart, Nelson, Robinson, Olsen, & McNeilly-Choque, 1998; McComas, Johnson, & Symons, 2005; Menna & Landy, 2001; Ostrov, Woods, Jansen, Casas, & Crick, 2004; Persson 2005a, 2005b; Schultz, Izard, & Ackerman, 2000). A body of literature also suggests that interventions for aggressive behaviour would be more effective if they were aimed at preschool children, instead of waiting until the early school grades (e.g., Goodwin, Pacey, & Grace, 2003; Hunter & Boyle, 2002; Landy & Menna, 2006; Vazsonyi & Keiley, 2007; Webster-Stratton, & Taylor, 2001; Webster-Stratton, Reid, & Stoolmiller, 2008).

Even though it has been established that aggression in preschool exists and that early intervention is crucial, the causes and correlates of aggression among preschoolers are still largely unknown. Research with school-age children has found certain links between children's aggression and other child variables, especially social-information processing (e.g., Camodeca & Goossens, 2005; Crick, & Dodge, 1996; Crick, & Grotpeter, 1995; Crick, Grotpeter, & Bigbee, 2002; Dodge, 1980; Dodge, & Crick, 1990; Harvey, Fletcher, & French, 2001; Hudley & Graham, 1993; Lemerise, Fredstorm, Keyll, Bowersox, & Waford, 2006; Quiggle, Garber, Panak, & Dodge, 1992; Shultz & Shaw, 2003; White, Rubin, & Graczyk, 2002; Zimmerman, Glew, Christakis, & Katon, 2005), affective-

perspective taking skills (e.g., Arsenio & Lemerise, 2001; Bohnert, Crnic, & Lim, 2003; Schultz, Izard, & Ackerman, 2000), language skills (e.g., Adams, Snowling, Hennesy, & Kind, 1999; Brownlie et al., 2004; Cohen, Davine, Horodenzky, Lipsett, & Isaacson, 1993; Stevenson, Van Daal, Verhoeven, & van Balkom, 2007), and gender (e.g., Crick & Zahn-Waxler, 2003; Hay, 2007; Joussemet et al., 2008; Lee, Baillargeon, Vermunt, Wu, & Tremblay, 2007). Despite these consistent findings in the research among school-age children, these links have not yet been established among preschool children; this is the purpose of the current study.

Study Purpose and Objectives

The overall purpose of the current study was to examine how physical and relational aggression in preschool children (ages 3 to 6 years) is related to their social-information processing, language skills, affective-perspective taking ability, and gender. This study had five objectives.

The first objective was to examine whether there are gender differences in relational and physical aggression among children ages 3 to 6 years. Additionally, it was to examine whether these gender differences are present for both parent- and teacher-reported physical and relational aggression.

The second objective was to examine how the child's tendency to infer hostile intent in ambiguous situations (or 'assume the worst' when something bad happens) is related to the child's relational and physical aggression. Specifically, it was to examine whether the tendency to infer hostile intent can predict children's aggressive behaviour. Also, as part of this objective, the goal was to explore whether there are links between the type of

situation in which the child makes hostile attributions and the type of aggression that the child tends to engage in. The aim was to see whether children who tend to infer hostile intent in situations that involve possible relational aggression are more likely to engage in relational aggression themselves, and whether children who tend to infer hostile intent in situations that involve possible physical aggression will be more likely to engage in physical aggression.

The third objective was to explore how a child's proposed responses to ambiguous situations are related to their own aggressive behaviour. It was to examine whether children who offer aggressive responses to the question, "What would you do if this happened to you?" are higher in teacher-reported and parent-reported aggression compared to those who suggest non-aggressive responses. In addition, it was to examine whether there is a link between tendency to suggest aggressive responses to relational situations and actual relational aggression and between tendency to suggest aggressive responses to physical situations and actual physical aggression.

The fourth objective was to examine whether a child's emotion knowledge, specifically his or her affective-perspective taking ability, is related to the child's physical and relational aggression. A child's ability to name emotions, to infer emotions experienced by characters in stories, and to explain the reasoning behind these emotions was examined and was used to predict a child's physical and relational aggression.

The fifth objective was to examine how language skill is related to a child's aggression. Links between language skill and physical aggression, as well as language skill and relational aggression was explored.

Definitions of Aggressive Behaviour in Children

Research on aggression has traditionally focused on the most obvious types of aggression: kicking, hitting, punching, and pushing, but aggression is actually best understood as a heterogeneous set of behaviours (e.g., Casas et al., 2006; Crick et al., 1997; Munoz, Braza, & Carrerras, 2004; Werner, Cassidy, & Juliano, 2006) that are simply defined as being directed toward the goal of harming another living being (e.g., Buss, 1961; Baron & Richardson, 1994). The nature of the harm, nonetheless, varies a great deal. Aggressive behaviour can be classified into a number of different dichotomies including, for example, covert or overt (e.g., Patterson, Shaw, Snyder, & Yoeger, 2005), proactive or reactive (e.g., Crick & Dodge, 1996), and relational or physical (e.g., Crick et al., 2002).

Whereas covert aggression refers to behaviour intended to cause harm in which the identity and/or intention of the aggressor is not immediately obvious, overt aggression is behaviour intended to cause harm in which the identity and intention of the aggressor is clear. For example, if a young child stole another child's cookie when the child was not looking, that would be covert, but if he punched a peer or called a peer a "dummy," that would be overt.

Physical aggression is one of the most discussed types of overt aggression. Physical aggression occurs when one person purposely tries to harm another person through some physical means, such as hitting, kicking, pushing, or punching, and this often results in some type of physical harm, such as pain and injury.

One of the first researchers to discover that girls tend to engage in a different, more covert type of aggression was Feshbach (1969). In researching Grade 1 children's responses to other children, Feshbach (1969) noticed that girls tended to aggress against others by excluding them from social groups and withholding friendship. At the time, Feshbach (1969) referred to this type of aggression as "indirect." Despite, Feshbach's (1969) finding, very little research was conducted on girls' aggression over the next few decades; instead it tended to focus on boys (e.g., see Dodge & Crick, 1990 for a review). Later, Lagerspetz, Bjorkqvist, and Peltonen (1988) investigated gender differences in Grade 5 children and noticed that girls tended to use more nonverbal aggression, whereas boys tended to use more verbal forms of aggression. An analysis of these types of aggression that the girls in this early study used shows that it does, in fact, include many of the types of behaviour described by Feshbach (1969). While researching aggression in young children, Crick and Grotpeter (1995) also noticed this more covert type of aggression that seemed to be particularly common among young girls. They noticed that many young girls chose to harm one another by leaving each other out of playgroups, refusing to be friends, and spreading rumours, similar to what Feshbach (1969) and Lagerspetz et al. (1988) noticed. Because this type of aggression involves intending to cause harm by damaging or controlling relationships, Crick and Grotpeter (1995) coined the term "relational aggression" to describe it. In addition, Crick and Grotpeter (1995) developed a peer-report instrument to measure relational aggression, along with the more traditional overt types of aggression. Crick and Grotpeter (1995) argued that research was needed on relational aggression because very little was known about it in terms of causes and correlates (except that it was more common in girls) and because the problems that it

may cause had not yet been explored. Later, a teacher-report measure of relational aggression was created (Crick, 1996) and teacher and peer-report questionnaires were adapted for preschoolers into new measures called the Preschool Social Behaviour Scale – Teacher Report and the Preschool Social Behaviour Scale – Peer Report (Crick et al., 1997).

Relational aggression has been contrasted with overt aggression so that a set of aggressive behaviour are categorized as either relational or overt (e.g., Crick et al., 1997; Hart et al., 1998). In fact, the Preschool Social Behaviour Scale (Crick et al., 1997) contains a scale measuring overt aggression, which combines threats of physical aggression, actual physical aggression, and destruction of property all into one scale called “overt aggression.” This scale is compared to another scale which measures only relational aggression. Nevertheless, relational aggression could be more suitably contrasted with physical aggression for two reasons. First, the terms physical aggression and relational aggression both describe the act of aggression (i.e., involving physical contact or the manipulation of relationships) as well as the outcome (i.e., bodily injury or damage to relationships). Overt aggression, in contrast, only describes the act (that the perpetrator’s identity and intention is clear). Second, overt aggression is a broader category than relational aggression and physical aggression. Aggressive behaviour can frequently be both overt and relational (e.g., screaming “I hate you and you can’t play with me!”), but aggressive behaviour that is both physical and relational is less likely. Therefore, relational aggression versus physical aggression may be a more appropriate dichotomy than relational aggression versus overt aggression. As with any dichotomy, behaviour does not always fit neatly into one category or another, however. The

important point is that any behaviour directed at another aimed at intentionally causing harm can be considered aggressive, regardless of whether it causes physical harm or damage to relationships.

Long-Term Negative Outcomes of Aggressive Behaviour

Aside from the obvious immediate negative effects of aggression on the victims (e.g., pain, injury, embarrassment, shame), preschool aggressors themselves are also at risk for a host of problems (Campbell et al., 2000; Coté, Vallaincourt, LeBlanc, Nagin, & Tremblay, 2006; Crick et al., 1997; Ostrov et al., 2004). Preschoolers who are physically aggressive towards others are also more likely to be rejected by others and to be targets of physical aggression, which can lead to being more fearful, anxious, and depressed than their peers (Crick et al. 1997; Crick et al. 1999). Physical aggression is not something that young children just outgrow; physical aggression at preschool age has been linked to physically aggressive behaviour five years later (Stormont, 2000), and into later childhood, adolescence, and adulthood (e.g., Campbell et al., 2000; Coté et al., 2006). Research suggests that children who are especially high in physical aggression at a young age are more likely to be aggressive and experience school and social problems as they grow up (e.g., Tremblay et al., 2004; Webster-Stratton & Taylor, 2001). Furthermore, physically aggressive behaviour at preschool age has been linked to internalizing problems, problems with home-life, behaviour problems in school, and poorer academic performance later on (Shelton et al., 2000), and to stealing, truancy, drug use, association with delinquent peers, and legal problems as an adolescent and as a young adult (Loeber, 1990; Dodge, 2006). Aside from the painful emotional costs to individuals, aggressive

behaviour results in huge financial costs to society at large. For example, it has been estimated that chronically antisocial individuals cost American society between 1.6 and 2.2 million dollars each over their life span (Cohen, 1998).

Although less research has been conducted on relational aggression in preschool children, relationally aggressive children are also at risk for problems later on (Crick et al., 2006). Preschool children who engage in relational aggression are also more likely to be victims of relational aggression (Crick et al., 1997; Crick et al., 1999), which puts them at risk for symptoms of depression, anxiety, and loneliness (Crick & Grotpeter, 1996). Relational aggression appears to remain fairly stable over time so that those who are relationally aggressive also do not typically just ‘outgrow it’ (Crick et al., 2006; Ostrov et al., 2004; Ostrov, Ries, Stauffacher, Godleski, & Mullins, 2008). Among older groups, relationally aggressive children report high levels of depression, loneliness, peer rejection, and poor self-concept (Crick & Grotpeter, 1995; Grotpeter & Crick, 1996). Even though the links between aggressive behaviour and adjustment problems later on are likely bidirectional, the existence of these relationships means that some children can be identified as at-risk at preschool age and early intervention strategies can be developed.

Gender Differences in Aggressive Behaviour in Preschoolers

It has already been established that gender differences in aggressive behaviour are present among older children, such that boys are more physically aggressive (e.g., Archer, Pearson, & Westmen, 1988; Crick & Grotpeter, 1996; Crick et al. 2002; Crick & Zahn-Waxler, 2003; Grotpeter & Crick, 1996; Lahey et al., 2000; Lee, Baillargeon, Vermunt, Wu, & Tremblay, 2007; Romano, Tremblay Boulerice, & Swisher, 2005; Smith & Gross,

2006) and girls are more relationally aggressive (e.g., Capella & Weinstein, 2006; Crick, 1997; Crick & Grotpeter, 1995; Crick & Grotpeter, 1996; Crick et al., 2002; Crick, Ostrov, Appleyard, Jansen, & Casas, 2004; Crick & Zahn-Waxler, 2003; Grotpeter & Crick, 1996; Smith & Gross, 2006). In addition, a body of research supports the existence of gender differences at the preschool age (e.g., Bonica et al., 2003; Burr et al., 2005; Côté et al., 2006; Crick et al., 1997; Crick et al., 1999; Crick et al., 2006; Dunn & Hughes, 2001; McEvoy, Estrem, Rodriguez, & Olson, 2003; Ostrov & Keating, 2004; Schultz et al., 2000; Strayer, & Roberts, 2004; Tomada & Schneider, 1997; Vaughn et al., 2003; Werner et al., 2006).

Telling evidence of a gender difference in physical aggression was gathered in a nation-wide study of aggression in Canadian children. (Côté et al., 2006). In this study of 15 579 Canadian children who were followed longitudinally from age 2 years to 11 years, Côté et al. (2006) found that boys were significantly higher in physical aggression than were girls. Physical aggression was measured through interviews with the person most knowledgeable about each child in the study (usually a parent). The greatest risk-factor for a physically aggressive trajectory was being male; being male was a greater risk-factor than coming from a low-income family or having a mother with a low education level.

Studies using teacher-reports of aggression have also supported the finding of higher physical aggression in boys (Crick et al., 1997; Crick et al., 1999) and have suggested higher levels of relational aggression in girls (e.g., Bonica et al., 2003; Crick et al., 1997; Crick et al., 1999). Crick et al. (1997) designed the Preschool Social Behaviour Scale Teacher Report (PSBS-TF) to explore physical and relational aggression in young

children. To assess relational aggression, teachers rated children on 6 items on a scale of 1 to 5. The measure included items like “tries to get others to dislike a peer” and “tells a peer that they won’t be invited to their birthday party unless he or she does what the child wants.” In their sample of 65 children (ages 3-5-years), they found that girls were significantly higher in teacher-reported relational aggression than their male peers. Overt aggression included three physical aggression items (“kicks or hits others”, “pushes or shoves other children”, and “hurts other children by pinching them”) and three other types of overt aggression (“verbally threatens to hit or beat up other children,” “ruins other peer’s things when he or she is upset,” and “verbally threatens to harm a peer in order to get what they want”). Boys were higher in teacher-reported overt aggression. Crick et al. (1997) also used a peer-report measure of physical and relational aggression, but interestingly, gender differences in peer-reported aggression were not significant in this sample. In a sample of 9- to 12-year-olds, however, Crick (1997) found that girls were significantly higher in peer-reported relational aggression and that boys were significantly higher in peer-reported overt aggression. Additionally, in a larger sample of 129 preschoolers, Crick et al. (1999) found that boys were significantly higher in peer-reported overt aggression, compared to girls, though no significant differences in peer-reported relational aggression were observed. The fact that gender differences in peer-reported aggression are less robust in preschoolers than older children may be explained by younger children’s greater tendency to play with same-sex peers (Colwell & Lindsay, 2005); which may make them less likely to know about the behaviour of their other-sex peers. Consistent with previous findings, Crick et al. (1999) found that girls were significantly higher in teacher-reported relational aggression, compared to boys.

Furthermore, Bonica et al. (2003) found that girls in a sample of 145 preschoolers engaged in significantly more teacher-reported relational aggression, compared to their male peers. Teacher-reported aggression in young children is especially important because teachers may observe children in social contexts more often than other important adults, like parents do.

The contention that boys are more physically aggressive than girls has also been supported through observational means (Farver, 1996; Strayer & Roberts, 2004; Werner et al., 2006). Strayer and Roberts (2004) randomly assigned 5-year-old children to play groups where they played with other children that they had never met and their behaviour was observed using video cameras. Strayer and Roberts (2004) found that boys engaged in significantly more physical and verbal aggression than girls and that boys also argued over objects more than their female counterparts. Furthermore, Werner et al. (2006) observed 67 preschoolers playing during free-time in a child care setting and found that male preschoolers engaged in significantly more physical aggression compared to their female peers. Additionally, in an observational study of 64 children (age 4 years) during free-play, Farver (1996) found that boys engaged in more overall aggression (including physical and verbal forms of aggression, but not relational) than girls. Also, boys tended to encourage aggression more by approaching one another during a fight and watching a fight (Farver, 1996).

Consistent with the finding that girls engage in more teacher-reported relational aggression, studies that have examined relational aggression through direct observation have also found more relational aggression in preschool girls (e.g., Burr et al., 2005; McEvoy et al., 2003; Ostrov & Keating, 2004; Ostrov et al., 2006). Ostrov & Keating

(2004) observed 48 children during free-play and found that girls engaged in significantly more observed relational aggression, whereas boys engaged in significantly more physical aggression and verbal aggression than girls. In addition, measures of observed aggression were significantly correlated with teacher-reported aggression, assessed with the PSBS-TF. Furthermore, McEvoy et al. (2003) measured preschoolers' aggression through teacher-report, peer-report, and observational data and found that girls were significantly more relationally aggressive and that boys were significantly more physically aggressive. In addition, there were high rates of agreement between the three types of aggression measures (McEvoy et al., 2003). Ostrov et al. (2004) videotaped preschoolers engaging in a colouring task in which there was purposely one desirable material (e.g., a bright orange crayon for a Winnie the Pooh picture while all the rest of the crayons were white). In this procedure, girls received and engaged in significantly more relational aggression, while boys received and engaged in significantly more physical aggression.

Longitudinal studies provide support for gender differences in preschoolers' aggression as well (e.g., Burr et al., 2005; Crick et al., 2006). In a year-long longitudinal study of relational aggression in preschoolers, Burr et al. (2005) observed children's behaviour in the classroom, in the gymnasium, and on the playground. They found that girls were significantly more relationally aggressive than their male peers, but that the level of relational aggression in boys increased over the school year. Similarly, in an 18-month longitudinal study of 91 preschoolers, Crick et al. (2006) found that, as expected, boys were significantly higher in physical aggression and that girls were significantly

higher in relational aggression. Aggression was measured through direct observation, teacher report (using the PSBS-TF), and peer-report.

Young boys may learn to associate physical aggression with pleasure and play from an early age (Benenson, Carder, & Geib-Cole, 2008; Colwell & Lindsay, 2005; Dunn & Hughes, 2001). In a study investigating children's play behaviour, Dunn & Hughes (2001) found that boys engaged in more violent fantasy play than girls. This was the case in a group of "hard-to-manage" preschoolers and in a more typical group of preschoolers. Similarly, in an observational study of the playground play of 60 preschoolers, Colwell & Lindsay (2005) found that boys engaged in significantly more rough-and-tumble play than girls. In a study of children ages 4, 5, 6, and 9, Benenson et al. (2008) found that when asked to describe their favourite things to do with toys, boys tended to describe using toys to enact physical aggression on animate beings more often than girls at all age levels (50% for boys and 10% for girls). In addition, Benenson et al. (2008) noted that preference for engaging in aggression-related activities and watching (physically) aggressive television programs increased with age for boys, but not for girls. The authors argue that boys are being socialized to see physical aggression not simply as acceptable, but as desirable and fun.

Even preschool children themselves seem to be aware of the gendered nature of relational and physical aggression (Giles & Heyman, 2005). Preschoolers were asked open-ended questions about what boys and girls do when they want to be mean (e.g., "What do boys do when they want to be mean to other boys?"). The children reported significantly more relationally aggressive behaviour when they were asked what girls do when they want to be mean and they reported significantly more physically aggressive

behaviour when they were asked what boys do when they want to be mean. In addition, preschoolers were presented with brief stories describing physical and relational aggression and were asked to guess whether the perpetrator in the story was a boy or a girl. Preschoolers tended to assume that the perpetrator was male significantly more often in stories involving physical aggression and they tended to guess that the perpetrator was female significantly more often in stories involving relational aggression. Furthermore, when children were presented with stories describing relational aggression and physical aggression and were later asked to remember the gender of the perpetrator in each story, they were more likely to make mistakes if the aggressive behaviour was incongruent with the gendered patterns. That is, they tended to make more mistakes when asked to remember that a boy was relationally aggressive or that a girl was physically aggressive than vice versa. Taken together, these results suggest that children already know about gender differences in aggression, and actually expect them, even at preschool age. Applying gender-schema theory to these findings, one might say that children come to understand that a boy is supposed to be physically aggressive and a girl is supposed to be relationally aggressive and then might engage in that behaviour to conform to their socially-defined gender roles (e.g., Martin, Ruble, & Szkrybalo, 2002).

Evidence suggests that children may learn about the gendered nature of aggression from watching television even at preschool age (Ostrov & Crick, 2006). In a sample of preschoolers, hours of time spent watching television was found to be significantly correlated with teacher-reported and observed relational aggression, in girls, but not boys; whereas hours of time spent watching television was found to be significantly correlated with teacher-reported and observed physical aggression, in boys, but not girls (Ostrov &

Crick, 2006). This suggests that watching television is related to children's engagement in gender-typical types of aggressive behaviour.

Some researchers have failed to find gender differences in preschoolers' aggressive behaviour (e.g., Hart et al., 1998; Perrson 2005a; 2005b). In a sample of nursery-school children living in Russia, Hart et al. (1998) did not find significant gender differences in teacher-reported overt or relational aggression, using the PSBS-TF. The authors suggest that the lack of gender differences could be due to Russian culture. Hart et al. (1998) point out that peer-group sanctions and exclusionary tactics, akin to relational aggression, were common under the former Soviet collective. Since the teachers were likely raised under this collective, they may have viewed relational aggression as more normative and equal among boys and girls. Hart et al.'s (1998) very low rates of teacher-reported aggression overall partially explain why no gender differences were found. Since they reported such low rates of aggression, it was unlikely that gender differences would be evident.

In two longitudinal, observational studies of aggressive behaviour in preschool children, Perrson (2005a; 2005b) did not find gender differences either. The failure to find gender differences could be explained by four factors. First, the sample sizes in both studies were small (37 in 2005a; 44 in 2005b), which would contribute to decreased external validity and restriction in range. Second, aggressive behaviour was observed by only one person (Perrson, 2005a; 2005b), likely the author, and he hypothesized that he would not find any gender differences (Perrson, 2005a). Therefore, experimenter bias could have contributed to the non-finding. Third, cultural differences may have played a role because both studies took place in Sweden, a country that is sometimes considered

the most gender-equal country in the world (Nyman, 1999). Fourth, Perrson (2005b) did not break aggressive behaviour into the categories of relational and overt or physical aggression. Instead, aggression was categorized as reactive, proactive hostile, or proactive instrumental. Perhaps if the aggressive behaviour was broken down into the two types of aggression in which gender differences have typically been found in this age group, results would have been more consistent with other research.

In summary, most studies on preschool aggression suggest that boys are more physically aggressive (e.g., Burr et al., 2005; Côté et al., 2006; Crick et al., 1997; Crick et al., 1999; Crick et al., 2006; Dunn & Hughes, 2001; Strayer & Roberts, 2004; Werner et al., 2006). In addition, those studies that have examined relational aggression have found consistent support for higher levels of relational aggression in girls (e.g., Bonica et al., 2003; Crick et al., 1997; Crick et al., 1999; Crick et al., 2006; Ostrov & Keating, 2004). Even though a few studies have failed to find gender differences in aggression at the preschool age (e.g., Hart et al., 1998; Perrson 2005a; Perrson 2005b), the non-findings can mostly be explained by cultural differences and/or methodological weaknesses.

Social-Information Processing Explanations of Aggressive Behaviour

Researchers have argued that behaviour in social situations is related to a number of steps involving the processing of social cues (e.g., Crick & Dodge, 1994; Crick & Dodge, 1996; Dodge & Crick, 1990; Dodge et al., 2003; Dodge, Lochman, & Laird, 1999; Dodge, Pettit, McClaskey, & Brown, 1986; McFall, 1982; McFall, 1982). McFall (1982) and McFall and Dodge (1982) proposed that three kinds of processes were particularly crucial to successful behaviour in social situations: (1) encoding and interpretation of

cues, (2) response decision, and (3) response enactment. They suggested that failure at any one of these three steps could result in deviant behaviour, like aggressive behaviour. Dodge et al. (1986) expanded this concept and came up with a detailed model with an original series of five steps that they considered critically important to successful social behaviour.

The first step of social-information processing in the Dodge et al. (1986) model is to encode the appropriate relevant cues from the wide array of possible cues to encode. They posited that if a person failed at this step, aggressive behaviour could result, as is the case when an aggressive child fails to encode important facial cues from those who interact with him/her.

The second step in the model is to interpret the cues that have been encoded (Dodge et al., 1986). This is related to Step 1 because it means that certain cues will be given more attention than others. It is also related to children's own ideas about themselves, such as what they did in the past in similar situations.

The third step of social-information processing requires the person to access a repertoire of possible responses to the social stimulus from long-term memory (Dodge et al., 1986). Associative networks and other access rules are said to help a person to select a response. Dodge et al. (1986) argue that if a person is biased towards selecting an aggressive response, rather than choosing from a variety of possible behaviour, that person is more likely to engage in deviant behaviour.

The fourth step of social-information processing requires a person to consider and evaluate the possible responses that could be chosen (Dodge et al., 1986). A person might consider many responses simultaneously and choose the one that seems best or a

person might evaluate each response sequentially. At this stage, if an individual has a bias toward evaluating aggressive responses positively, that person will be more likely to behave aggressively. For example, a child who has been rewarded for aggressive behaviour in the past might view this as more favourable and select this response over other responses.

The fifth and final step of social-information processing in the Dodge et al. (1986) model is response enactment. In this step, the person enacts the chosen response. At the same time, the person should engage in response monitoring, in which the person evaluates the effectiveness of the chosen response and attends to the responses of others. Then, the five-step process starts again.

Later, the 5-step model of social-information processing was reformulated into six steps: 1) encoding of external and internal cues, 2) interpretation and mental representation of those cues, 3) clarification of and selection of a goal, 4) response access or construction, 5) response decision, and 6) behavioural enactment (Crick & Dodge, 1994). The most obvious difference between the Crick and Dodge (1994) and the Dodge et al. (1986) model is that an additional step was added – Step 3 in the new model (Clarification of and selection of a goal). Crick and Dodge (1994) also made some important clarifications to the model. They explain that, even though the model is presented in a series of steps, the actual processes may not be sequential and, in fact, several steps can happen simultaneously. They also indicate that the relationship between social-information processing and social experience is reciprocal; social experience plays an important role in the development of social-information processing and vice versa. Crick and Dodge (1994), further explain that, while the original model focused on latent

structures (e.g., schemas and ideas stored in long-term memory), the reformulated model also incorporates on-line processing (thinking on the spot and incorporating new ideas and responses).

Furthermore, Crick and Dodge (1994) describe the role that emotion plays in each of the six steps of social-information processing. At Step 1, (encoding of cues) the encoding of cues may involve emotional information, such as one's own racing heart or the facial expression of someone else. At Step 2, (interpretation of cues) emotions may influence a child's interpretation of cues, so that if the child is especially angry, scared, or sad, the interpretation may be impaired. For example, a child who feels nervous when meeting a peer for the first time may dislike that peer because of the nervousness that is associated with meeting that peer. In addition, a child's interpretation of cues, in itself, can lead to certain emotions, like anger. For example, a child who attributes hostile intent to some type of ambiguous situation may immediately become angry, which will then affect processing. At Step 3 (goal clarification), emotions can enhance or inhibit a child's ability to choose an appropriate goal. For example, if a child is feeling angry, the child may choose retaliation as a goal. In addition, goal choices can influence emotions. For example, if a child decides to escape from a situation, that choice in itself may reduce anxiety. At Step 4 (response access), a child's choice of behaviour may affect emotions. For example, if the child accesses the response of punching someone in the stomach, this may create relief from a feeling of anger. A child's emotions may also affect the type of responses chosen. For example, if the child is feeling afraid, that child may choose responses that would be most likely to reduce fear, such as getting away. At Step 5 (response decision), predicting emotional responses to one's behaviour can help guide the

choice of responses. For example, if a child knows that the teacher will be angry if the child breaks something, the child may choose an alternative response.

This social-information processing model of explaining the relationship of social cognition to physically aggressive behaviour has been supported empirically for each of the six steps (e.g., see Crick & Dodge, 1994 and Dodge & Crick, 1990 for reviews). The frustration-aggression hypothesis (Dollard, Doob, Miller, Mowrer & Sears, 1939; Berkowitz, 1989) has sometimes been contrasted with the social-information processing model (Berkowitz, 2008). The frustration-aggression hypothesis holds that people who are frustrated because of being unable to obtain a desired goal are more likely to be aggressive towards others (Berkowitz, 1989). After the social-information processing model received some criticism from Berkowitz (2008) for its supposed tendency to portray aggressive behaviour as resulting from carefully controlled, conscious, and voluntary reflection, Dodge (2008) highlighted some important characteristics of the model that are often overlooked. Dodge (2008) points out that many aspects of social-information processing involve automatic associations, that intent attribution decisions are not always made consciously, and that emotions play an important role in deciding social behaviour. Therefore, instead of being two competing theories, the frustration-aggression hypothesis and the social-information processing model of aggressive behaviour are actually compatible. The social-information processing model has been applied to research on relational aggression as well (e.g., Crick et al., 1997; Werner et al., 2006), but this area is still largely unexplored.

Step 1: Encoding of external and internal cues. Physically aggressive children's uses of cues are different in quantity and quality compared to their less aggressive peers.

Dodge and Tomlin (1987) presented children with various ambiguous provocation situations (in which one child harmed another child, but the intention was unclear).

Children were asked to infer the intent of the child who caused the harm (the provocateur). They were also asked to explain how they came to their conclusion.

Aggressive children were more likely to attend to their own self-schemata as opposed to cues that were provided in the vignettes. Compared to their peers, they were also more likely to pay attention to cues conveyed later, demonstrating a recency effect.

Furthermore, Dodge and Newman (1981) found that aggressive boys used less social cues overall compared to their peers when making interpretations about social situations and inferring guilt. Lochman and Dodge (1998) found that aggressive children were less likely than their non-aggressive peers to pay attention to new information about a social situation after being presented with information that would suggest hostile intent. Taken together, these studies suggest that aggressive behaviour may result from deviant processing at this very first stage of processing.

Step 2: Interpretation and mental representation of cues. Physically aggressive children tend to interpret cues differently than their less aggressive peers. Research suggests that aggressive children exhibit a hostile attribution bias; a term first coined by Nasby, Hayden and DePaulo (1980), which refers to a tendency to interpret hostile intent in the behaviour of others (e.g., Crick & Dodge, 1994; Dodge, 1980; Dodge, 2006; Dodge & Crick, 1990; Dodge & Frame, 1982; Dodge & Coie, 1987; Dodge et al., 1986; Dodge et al., 2003; McBrayer, Milich, & Hundley, 2003; Milich & Dodge, 1984; Orobio de Castro et al., 2002; Orobio de Castro, 2003).

In a meta-analysis of 41 studies with 6 017 participants, Orobio de Castro et al. (2002) found consistently convincing evidence for a link between hostile attribution bias and overt aggressive behaviour in children. An overall relationship between hostile attribution bias and children's aggressive behaviour was highly significant, $Z = 11.25$, $p < .001$, with an overall effect size of $r = .17$ (Orobio de Castro et al., 2002).

Dodge (1980) was among the first to notice this hostile attribution bias in a study he did with boys in Grades 2, 4, and 6. In Study 1, children were brought into a research trailer and were told to assemble a puzzle. They were made to believe that another child destroyed their puzzle, but the intention of the other child was manipulated so that it was benign, hostile, or ambiguous. Significant differences between teacher-reported physically aggressive children and non-aggressive children were found in the ambiguous situation (in which it was not clear whether the puzzle was destroyed by accident or on purpose). Aggressive children tended to behave as if the other child had acted with hostile intent, and non-aggressive children tended to behave as if the other child had acted with benign intent. Specifically, given the opportunity, the aggressive children were more likely to choose to retaliate by destroying the fictional peer's puzzle. In Study 2, children were presented with vignettes describing ambiguous provocation situations and were asked to infer the intent of the potential provocateur. Once again, the physically aggressive children were more likely to assume hostile intent, compared to their peers. Further support for a hostile attribution bias in physically aggressive boys was found by Dodge and Frame (1982), by Dodge and Coie (1987), and by Waas (1988).

These findings have been replicated with mixed-gender samples (e.g., Crick & Dodge, 1996; Erdley & Asher, 1996; McBrayer et al., 2003). Crick & Dodge (1996) presented

624 male and female 9- to 12-year-olds with ambiguous provocation situations and asked them to infer the intent of the provocateur. They found that those children who were higher in teacher-reported aggression, had a significantly greater tendency to assume hostile intent in ambiguous situations, compared to their peers. McBrayer et al. (2003) found that children who had been referred to a clinic due to their physically aggressive behaviour were significantly more likely than their peers to infer hostile intent in ambiguous situations (and interestingly, so were their mothers). Erdley & Asher (1996) also found that boys and girls who were higher in teacher-reported physical aggression were more likely to infer hostile intent in ambiguous provocation situations. Quiggle et al. (1992) found the same hostile attribution bias in boys and girls who were high in teacher-reported and peer-reported aggression.

Recent research including relational aggression has suggested that the tendency toward hostile attribution bias may depend on the correspondence between the nature of the aggression of the child and the nature of the provocation (Crick et al., 2002). In two studies of 127 and 535 Grade 3 children, Crick et al. (2002) found that those who were high in peer-reported relational aggression were more likely to infer hostile intent when presented with ambiguous provocation situations in which potential relational aggression was involved. Those children who were higher in peer-reported physical aggression were more likely to infer hostile intent when presented with ambiguous provocation situations in which potential overt (mostly physical) aggression was involved. This suggests that children have a tendency to infer hostile intent in the type of situations in which they tend to aggress themselves.

Support for the notion that hostile attribution bias may actually *cause* physically aggressive behaviour was found by Hudley & Graham (1993). A 12-session curriculum was designed to help 10- to 12-year-old boys decrease their hostile attribution bias. The curriculum specifically focused on decreasing the tendency to presume hostile intent in ambiguous situations, increasing the tendency to presume non-hostile intent, and increasing the likelihood of non-aggressive responses to provocations. Children were randomly assigned to be in the attribution style treatment group or an attention-training treatment group. Children's aggressive behaviour was measured by peer report and teacher report. Aggressive boys in the attribution style treatment showed a significant decrease in hostile attribution bias and this decrease was significantly greater compared to aggressive boys in the control (attention-training) condition. In addition, these boys showed significantly less teacher-reported aggressive behaviour following treatment. The findings of this study are particularly important because they not only confirm that a relationship exists between hostile attribution bias and aggressive behaviour, but they suggest that this relationship is causal (Hudley & Graham, 1993). Programs that targeted adolescent offenders (Guerra & Slaby, 1993) and young people at risk for conduct problems (Conduct Problems Prevention Research Group, 2002a, 2002b) have also been found to be effective, but they also focused on other aspects of social-information processing, rather than solely targeting reduction in hostile attribution bias.

Support for the idea that emotions can affect a child's processing of cues was found by Orobio de Castro et al. (2002). Fifty-seven 9- to 13-year-old boys were presented with vignettes describing provocations with ambiguous intent and were asked to infer the intent of the provocateur. In one condition, children's emotions were purposely altered,

and made negative, by forcing them to lose a manipulated computer game. Boys who were described as highly aggressive by their teachers were significantly more likely to infer hostile intent when they were under this negative affect condition, but less aggressive boys were not as influenced by the induced negative affect. This shows that negative emotions can also contribute to a tendency to infer hostile intent in children who already have this cognitive style. In addition, Schultz and Shaw (2003) found that maternal depression throughout a boy's early childhood, was related to his hostile attribution bias at age 10 (measured with ambiguous provocation vignettes). Perhaps being exposed to negative emotionality at a young age makes children more likely to assume that a person is experiencing negative emotions in ambiguous situations later on.

Aggressive boys are also more likely to make hostile attributions when they are under conditions that provide a threat of conflict (Dodge & Somberg, 1987). Sixty-five boys (ages 8 to 10) were presented with scenes of provocations between children their age on a television. In each situation, the provocateur's intention was hostile, prosocial, accidental, or ambiguous. After the boy viewed the first four vignettes, the experimenter left the room to supposedly get another child to join the task. The boy was made to believe that he was overhearing a conversation between the experimenter and this new child (actually an actor) in which the new child was upset and made comments like "if I have to go in there, I will only get in a fight with the boy." Then, the experimenter returned and had the child continue with the next 8 vignettes, telling him that the other boy would join soon, but that he was "in a bad mood." This made the boy feel that he would soon encounter a conflict situation. Boys who were high in teacher-reported and peer-reported aggression were more likely to be adversely affected by this situation in

that they made more hostile attributions and less accurate attributions, compared to their less aggressive peers. This suggests that aggressive children's ability to interpret cues and to resist hostile attribution bias is exacerbated when they are under a condition of threat (Dodge & Somberg, 1987).

In addition to a tendency to infer hostile intention in ambiguous situations, aggressive children have also been found to be more likely to make errors when inferring intentions in situations in which the intent was clearly hostile, clearly accidental, or clearly benign (e.g., Dodge et al., 1986; Dodge & Somberg, 1987). Together, these results provide support for the contention that deviant (and sometimes impaired) processing of social cues is related to, and may cause aggressive behaviour.

Step 3: Clarification of and selection of a goal. Children's evaluations of responses to social situations have been found to be related to their social goals. For example, in a sample of 237 school-aged children, Delveaux and Daniels (2000) found that favourable evaluations of aggressive responses were correlated with the goals of control, self-interest, and revenge, and were negatively correlated with the goals of equality and maintaining friendships. Favourable evaluations of relationally aggressive responses were especially associated with the goal of keeping out of trouble. Children who choose to enact relationally aggressive responses may do so because it is in keeping with their goal of control, self-interest and revenge, while still keeping them out of trouble (Delveaux & Daniels, 2000).

In addition, peer-reported aggressive children differ in their evaluations of social goals, compared to their less aggressive peers. For example, Lemerise et al. (2000) examined goal evaluations in 402 boys and girls in Grades 1, 3, and 5. Children's aggression was

measured by peer-report and they were interviewed using ambiguous provocation situations, in which the emotions of the provocateur were varied (happy, sad, or angry). They found that when provocateurs were depicted as angry or sad, rejected-aggressive children were more likely than their peers to rate hostile goals more positively and were more likely to rate prosocial goals less positively. This suggests that aggressive children differ from their peers in terms of the value that they place on different goals.

Erdley and Asher (1996) investigated how children who vary in their choice of behavioural response to an ambiguous provocation (aggression vs. withdrawal vs. problem-solving), but who are similar in their intent attributions, have different social goals. Ambiguous provocation situations were presented to 781 students in Grades 4 and 5 and children were asked to infer intent, and to choose a behavioural response. Then, children were selected for follow-up interviews and were asked to indicate what their social goals would be for three given situations. They chose from eight possibilities: (1) getting back at the protagonist, (2) working out the problem peacefully, (3) avoiding the protagonist, (4) hurting the person's feelings, (5) protecting the self, (6) taking care of the problem created by the protagonist, (7) maintaining a relationship, and (8) maintaining an assertive reputation. Children who advocated aggressive responses to ambiguous provocations were more likely to have hostile goals for their behaviour. Specifically, they were more focused on punishing the protagonist and on protecting the self and they were less concerned with preserving relationships, compared to their peers. Taken together, these findings suggest that children who choose aggressive responses do so, in part, because they select different goals than children who choose less aggressive responses.

Step 4: Response access or construction. Aggressive children are less likely to access non-aggressive responses as possible ideas for responses to provocations (Dodge et al., 1986). Clinic-referred aggressive boys and girls were presented with ambiguous provocation situations and were asked to come up with ways that one could respond to these situations. Compared to their peers, aggressive children provided less non-aggressive responses and more aggressive responses (Dodge et al., 1986).

Further support for this view was found by Wood and Gross (2002) in a study of a group of boys and girls in Grades 3 and 4. Children were classified as rejected and aggressive based on peer-report and teacher report and were compared to their less aggressive, less rejected peers. When presented with ambiguous provocation situations, aggressive children were more likely to infer hostile intent, supporting previous research findings regarding Step 2 of the social-information processing model. In addition, when they were asked to *generate* possible responses, the aggressive children came up with significantly more aggressive responses compared to their peers.

Similar evidence was found by Quiggle et al. (1992). They presented 220 boys and girls, ages 9 to 12 years, with provocation situations and asked them how they might respond in the situations. Children who were higher in peer-reported and teacher-reported aggression tended to come up with significantly more aggressive responses, compared to their less aggressive peers.

Response access may be related to the conflicts that children witness. Evidence suggests that children who are exposed to marital conflict are more likely to behave aggressively (O'Brien, Bahadur, Gee, Balto, & Erber, 1997). Children who scored more poorly on an assessment of coping responses to conflict were more likely to engage in

teacher-reported aggressive and delinquent behaviour (O'Brien et al., 1997). Exposure to maladaptive coping strategies in parents has been linked to increased aggressive behaviour in children (Cummings, Goeke-Morey, & Papp, 2004). Children who are exposed to marital conflict may be more likely to access aggressive responses, compared to their peers, due to their frequent exposure to conflict and those children who fail to develop effective coping strategies may be especially at risk. Taken together, these studies suggest that aggressive behaviour can be explained partly by the types of responses that children are able to generate and access.

Step 5: Response decision. Boys with peer adjustment problems tend to evaluate aggressive responses more favourably and tend to view prosocial responses less favourably, compared to their peers (Asarnow & Callan, 1985). Clinic-referred aggressive boys and girls are also more likely to evaluate aggressive responses positively than their less aggressive peers (Dodge et al., 1986). Aggressive children expect better outcomes for aggressive behaviour (such as reduced negative treatment by others and increased tangible rewards), compared to their non-aggressive peers (Perry, Perry, & Rasmussen, 1986).

Similar results were found by Erdley and Asher (1998) with a sample of 781 boys and girls. Children were presented with 10 ambiguous provocation vignettes and were asked to choose from a list of responses, the response that they would choose to the provocation. They were also asked questions to assess their attitudes toward the legitimacy of aggression. Children who were higher in peer-reported aggression tended to choose aggressive responses to ambiguous situations more often and they also tended to

have more favourable attitudes toward aggressive behaviour, viewing it as more legitimate, compared to their less aggressive peers (Erdley and Asher, 1998).

Evidence suggests that children's decisions of responses to social situations are linked to the nature of their own aggressive behaviour (Crick & Werner, 1998). In a study of 1166 boys and girls in Grades 3 to 6, Crick and Werner (1998) found that aggressive children tended to view aggressive responses to ambiguous situations more favourably, compared to their less aggressive peers. Overtly aggressive boys and girls evaluated overtly aggressive responses to instrumental conflict situations relatively favourably. Overtly aggressive girls, but not boys, viewed overtly aggressive responses to relational conflict situations favourably. Boys who were relationally aggressive viewed relationally aggressive responses to instrumental provocation situations favourably. Additionally, boys overall evaluated physically aggressive responses to ambiguous provocation situations more favourably than their female peers. They also found that girls overall evaluated relationally aggressive responses more favourably than their male peers.

Similarly, White et al. (2002) found that children who were higher in peer-reported aggression responded more favourably to vignettes describing aggressive children, while their less aggressive peers responded less favourably. Aggressive children were more likely to say that they would include an aggressive child in their activities (like eating lunch, going to a party) and that they would include an aggressive child in their peer group. Aggressive children had significantly less negative affective responses to aggressive vignettes, compared to their less aggressive peers. This suggests that children who do not tend to behave aggressively have negative evaluations of aggressive

behaviour and aggressive children's relative lack of negative evaluations is related to their decisions to engage in aggressive behaviour.

Aggressive children show higher levels of confidence in their abilities to enact aggressive behaviour and lower levels of confidence in their abilities to inhibit aggressive responses (Perry et al., 1986). Likewise, Quiggle et al. (1992) found that aggressive children viewed aggressive responses to ambiguous situations more favourably and considered aggressive behaviour easier to carry out than passive or assertive responses. In addition, these evaluations were significantly different compared to their peers. Together, these studies suggest that aggressive children respond aggressively partly because they view aggressive responses as better and as easier than their peers do.

Step 6: Behavioural enactment. After going through Steps 1-5, children then enact their behaviour. The reasons why some children enact aggressive behaviour and others do not, relates to the processing at the previous five steps (Crick & Dodge, 1994).

Social-Information Processing Research with Preschool Children

Relatively little research has been done on the link between social-information processing and aggressive behaviour in preschool children. Nonetheless, the research that has been done with this age group suggests that the social-information processing model can be applied to their aggressive behaviour (e.g., Gouze, 1987; Mize & Ladd, 1988; Werner et al. 2006).

Some support for differences between aggressive children and their peers in Step 1, encoding of cues, was found by Gouze (1987). Forty-three preschool boys engaged in a task in which they were required to watch a video-taped puppet show of two characters

getting along (e.g., sharing a cookie) or two characters in conflict (e.g., fighting over a ball). At the same time, they were told to keep an eye on the red light on the wall beside them and to push a button every time it came on. Children who were higher in peer-reported and teacher-reported physical aggression had more difficulty doing the light task when the puppet show involved aggression, compared to when the puppet show involved friendly interaction. This difficulty was significantly greater for aggressive boys, compared to their less aggressive peers. This suggests that aggressive children have a tendency to pay greater attention to aggressive cues than less aggressive cues compared to their peers, and this could explain why they tend to assume hostile intent, and react aggressively more often. Dodge, Bates, & Pettit (1990) explored aggressive 5-year-olds' ability to appropriately encode social-information compared to their peers. To measure encoding skill, Dodge et al. (1990) required children to recall the details of social vignettes and to decide whether aspects of the vignette were relevant, somewhat relevant or not relevant. Results showed that children who were higher in teacher-reported aggression were more likely to make errors in encoding.

Step 2, interpretation and mental representation of cues, is an especially important step among young children. Dodge (2006) contends that everyone has hostile attribution biases as very young children. He posits that because of their primitive thinking style, young children immediately associate outcome with intention. So, for example, if a child is bumped by someone and falls down, the tendency early on is to associate the pain of falling down with the intention of the other person and assume that this must have been done on purpose. He argues, however, that many children eventually learn to develop a tendency toward benign intentions; they are taught not to assume the worst, but to realize

that sometimes we harm each other by mistake. It is those children who fail to learn this tendency to assume benign intent and who hold on to their primitive tendency to assume hostile intent that are especially prone to aggressive behaviour (Dodge, 2006). In light of this assertion, exploring hostile attribution biases among young children is especially important in our discovery of what differentiates aggressive children from their less aggressive peers.

Schultz et al. (2000) found that boys who were higher in teacher-reported aggression had a greater tendency to label the emotions of protagonists in a series of stories as angry compared to their peers. This suggests that the interpretation (and sometimes misinterpretation) of social cues as indicating anger may be linked to child's tendency to behave aggressively. Furthermore, in a study of 68 children presented with videotaped social situations, Katsurada, and Sugawara (1998) found a link between hostile attribution bias and teacher-reported aggressive behaviour among preschoolers.

The field of positive psychology has also recently added to the growing evidence of the importance of Step 2, and attribution biases specifically, in determining social behaviour. For example, in a study of social-information processing among 1 364 children, studied in preschool and Grade 1, Runions and Keating (2007) found that about a quarter of children tended to have the opposite of hostile attribution bias; a benign attribution bias. These "Pollyanna Preschoolers" (Runions & Keating, 2007, p. 838) tended to assume the best in others, attributing benign attention uniformly when presented with vignettes involving some type of harm. In addition, this tendency to assume benign intent was associated with lower levels of parent- and teacher-reported externalizing behaviour. Interestingly, intent attributions in preschool was a better predictor of problem behaviour than was intent

attributions in Grade 1; which highlights the importance of examining early social-information processing.

Werner et al. (2006) found that preschool children's social-information processing at several levels was related to their experimenter-observed aggressive behaviour. Children were presented with 7 vignettes on television which were classified as hostile, prosocial, or ambiguous. The children were then asked to infer the intention of the provocateur (Step 2), to come up with possible responses to the provocation (Step 4), to evaluate the effectiveness of several responses to the provocations provided to them (relational aggression, overt aggression, competent, or incompetent/passive) (Step 5), and to select one of the strategies that would be most effective (Step 5). In addition, a composite score made up of children's accuracy of responding and tendency to choose competent responses to the questions was calculated. They found that children who were able to generate competent strategies (Step 4) were less likely to engage in physically aggressive behaviour. In addition, the overall social-information processing composite score was negatively correlated with physical aggression. The authors failed to find an association between aggression and processing at Step 2, but this was likely because (1) the intentions were clear for 4 of the vignettes and only 3 were ambiguous and (2) the ambiguous vignettes lacked internal consistency (Werner et al., 2006). The findings of this study, nonetheless, provide convincing support for the idea that social-information processing plays a role in the aggressive behaviour of preschoolers.

Further support for the idea that differential processing at Steps 4 and 5, response access and response decision, is present in aggressive preschoolers was found by Mize and Ladd (1988). They presented children with ambiguous provocation situations

through the use of puppets. Children were given a puppet and were told to pretend that the puppet was them. They acted out conflict situations with another puppet controlled by the experimenter. For example, the experimenter made one of the puppets knock down a tower that the child (as represented by the puppet) was building. Children were then asked how they would respond. Children who were higher in peer-reported and teacher-reported aggression were more likely to say that they would respond aggressively (e.g., by punching or hair-pulling). This suggests that aggressive children tend to generate and decide on aggressive responses more often than their peers.

Affective-Perspective Taking and Aggressive Behaviour in Preschool Children

The necessity of understanding and interpreting emotions has been highlighted as an important part of social-information processing (e.g., Crick & Dodge, 1994; Dodge, 2006; Dodge, 2008). In addition, many researchers who have focused specifically on emotion knowledge, and affective-perspective taking in particular, have highlighted its importance in the development of aggressive behaviour (e.g., Arsenio, Cooperman, & Lover, 2000; Denham et al., 2002; Strayer & Roberts, 2004). Arsenio et al. (2000) investigated preschool children's emotion knowledge first, by having the children match basic emotion words with facial expressions of puppets and second, by having children indicate the feelings that puppets might be experiencing in various situations described in brief vignettes. This ability to infer the feelings of another person in a given situation is often referred to as affective perspective-taking. They found that naming the emotions corresponding to the facial expressions was fairly easy for the children, but that those who were high in teacher-reported and observed aggression were more likely to score

poorly on the affective-perspective taking assessment of emotion knowledge, compared to their less aggressive peers.

Denham et al. (2002) used this same method of measuring emotion knowledge to investigate aggressive trajectories among preschoolers. They found that lower levels of emotion knowledge at age 3 were related to higher levels of teacher-reported aggression at age 5.

Further evidence for a link between emotion knowledge and aggressive behaviour in preschool children was found by Strayer and Roberts (2004), who investigated aggressive behaviour in 24 5-year-old boys and girls. They found that children who were rated by their teachers as lower in the ability to be sensitive to, and to respond to, the emotions of others were higher in experimenter-observed aggression.

Using an affective-perspective taking task very similar to the one used in the current study, Garner, Dunsmore, and Southam-Gerrow (2007) explored the link between affective-perspective taking and aggression. Eighty-five children engaged in a triadic play task in a preschool setting. Children had free play, engaged in a game in which they were required to guide a marble through a hole using tubes, and played with a white board that had only one marker. Their aggressive behaviour was observed by videotape. For the affective-perspective taking task, children listened to a series of stories and were required to indicate the feeling that was most likely experienced by the protagonist in each story. A significant link was found between poor performance on the affective-perspective taking task and observed physically aggressive behaviour.

There is some recent research to suggest a causal relationship between understanding of emotions and aggressive behaviour. Izard et al. (2008) examined the effectiveness of

an emotion-based prevention program on the aggressive behaviour of children enrolled in Head Start programs. Results revealed that the program was effective; specifically, increased emotional understanding was associated with less aggressive behaviour in both rural and inner-city communities.

Taken together, these studies suggest that a child's ability to understand the feelings of another person affects how the child treats the other person. It follows logically that if children lack an understanding of how another person feels, the children may focus only on their own feelings and may lash out physically in frustration. In contrast, if a child is able to understand how another person feels the child may be more likely to avoid harming that person directly. No known studies have connected affective-perspective taking to relational aggression, but it would be expected that having a good grasp of how someone feels might be a useful tool for manipulating them using relational aggression, thus we might expect relational aggression to increase, along with affective-perspective taking.

Language Skills and Aggressive Behaviour

Language skills have been found to be related to aggressive behaviour. Poorer language skills are linked with higher levels of physical aggression (e.g., see Dionne, 2005 for a review).

In a study of 364 British children in Grades 3 to 6, Adams et al. (1999) found a significant relationship between receptive language skills, as assessed by items 1 to 23 of Receptive Vocabulary Scale of the Test of One-Word Knowledge (Wiig & Secord, 1991), and conduct problems and peer problems assessed using the Strengths and Difficulties Questionnaire (Goodman, 1997). Specifically, children with lower receptive vocabulary

scores had more conduct problems and peer problems; which are both associated with higher levels of aggression.

In a study of children, ages 4 to 12, referred for psychiatric treatment, Cohen et al. (1993) found that about one third of the children had unexpected language impairments that were not previously identified. The children with these unexpected language impairments had the most severe aggressive behaviour, greater than that of children with already identified language impairments and greater than children referred for treatment who did not have language impairments. This suggests that having language difficulty, especially if it remains untreated, can result in problems with aggression. Similarly, Brownlie et al. (2004) found that children with language impairments were more likely than their peers to behave aggressively as adolescents and young adults.

In a comparison of aggressive and non-aggressive boys, Cole (2001) found that aggressive boys scored significantly lower on measures of pragmatic language. Specifically, when telling stories based on a wordless picture book, aggressive boys had shorter mean lengths of utterances (a measure of syntactic complexity) and tended to provide significantly less detail about the plot of the story.

Language Skills and Aggressive Behaviour in Preschool Children

The link between aggressive behaviour and poorer language skills has also been found in preschoolers (e.g., Werner et al., 2006; Estrem, 2005; Bonica et al., 2003). Werner et al. (2006) investigated the relationship between language and physical aggression. The Test of Early Language Development, Second Edition (TELD-2) was used to assess language ability. This test assesses receptive and expressive language skills, as well as

semantic and syntactic development. Language ability on all three measures was negatively related to experimenter-observed physical aggression.

Similarly, in a study of 100 preschoolers, Estrem (2005) found that higher levels of teacher-reported overt and relational aggression were associated with lower levels of receptive and expressive language skill. Aggression was measured using the PSBS-Teacher Report and language skill was assessed using the Test of Early Language Development-3. When overt aggression was held constant, girls' expressive language skills predicted relational aggression more than boys' expressive language skills. When the alternative form of aggression was held constant, receptive language skills predicted overt aggression more than relational aggression, especially for boys.

Low levels of language ability in preschoolers have also been related to aggressive behaviour later on. For example, Stevenson, Richman and Graham (1985) found that children with poor language skills at age 3 years tended to behave aggressively 5 years later. Similarly, in a longitudinal investigation of developmental pathways, Moffit and Caspi (2001) found that language ability, assessed with a number of measures including the Peabody Picture Vocabulary Test was linked to antisocial behaviour (including aggression) later on.

The relationship between language skill and relational aggression in preschoolers has been less explored, but some evidence that greater language skill is linked to higher levels of relational aggression has been found (Bonica et al., 2003). In a sample of 63 male and female preschoolers, Bonica et al. (2003) investigated the relationship between relational aggression and three measures of language ability: the Expressive One-Word Vocabulary Test, the Peabody Picture Vocabulary Test-Revised, and expressive subscale of the

Illinois Test of Psycholinguistic Abilities. The Expressive One-Word Vocabulary Test assesses expressive language ability and it requires children to name pictures of common objects. The Peabody Picture Vocabulary Test-Revised assesses receptive language so that children do not have to speak to perform well. They are presented with words and must choose the appropriate picture to go with the given vocabulary word, by pointing. The expressive subscale of the Illinois Test of Psycholinguistic Abilities assesses verbal fluency by getting children to generate descriptions of objects. They found that performances on all three language measures were significantly correlated with teacher-reported relational aggression. Since a lot of relational aggression involves the use of language, it follows logically that those who are more relationally aggressive would have better language skills.

Other Factors Influencing Aggressive Behaviour

Biological Factors

There is an abundance of research to suggest that aggression is related to biological factors. For example, preschoolers' aggressive behaviour has been linked to their testosterone levels (e.g., Sanchez-Martin, Fano, Ahedo, Cardas, Brain, & Azpiroz, 2000). Additionally, low ranges of cortisol variability have been found to be linked to higher levels of aggression in children (McBurnett, Lahey, Rathouz, & Loeber, 2000) and recent research has suggested that cortisol levels moderate the relation between testosterone and aggression in adolescents (e.g., Popma et al., 2007). Furthermore, aggression has been linked to genetic factors as evidenced by twin studies (e.g., Baker, Jacobson, Raine, Lozano, & Bezdijan, 2007) and by adoption studies (e.g., Deter-Deckerd & Plomin,

1999). Additionally, aggressive behaviour has been linked to levels of certain neurotransmitters, including low levels of dopamine-beta-hydroxylase (e.g., Gabel, Stradler, Bjorn, Shindledecker & Bowdon, 1993) and serotonin (e.g., Van Goozen, Fairchild, Snoek, & Harold, 2007). Inasmuch as this evidence for the importance of examining biological factors is convincing, the current study focused on the psychological factors of cognition, affective-perspective taking skills, and language ability because they have more direct clinical relevance to informing interventions for aggressive behaviour.

Social Factors

It is important to remember that aggressive behaviour is also linked to factors outside of the individual child. Aggressive behaviour can also be influenced by aspects of the family, the community, and the society in which the child lives. For example, children's aggressive behaviour has been linked to family characteristics (e.g., Pettit, 1997) media depicting relational and physical aggression (e.g., Ostrov, Gentile, & Crick, 2006), and racism (e.g., Goodey, 1998).

Studies examining the influence of socio-economic status on aggression have tended to find that lower socio-economic status is associated with higher levels of aggression in children. For example, numerous studies have found a link between poverty or low-income status and aggression (e.g., Cote et al., 2007; Romano, Tremblay, Boulerice, & Swisher, 2005; Tremblay et al., 2004; Winslow & Shaw, 2007). In addition, low maternal education has been identified as a risk factor for physical aggression in children (e.g., Borge, Rutter, Cote, & Tremblay, 2004; Cote et al., 2007; Nagin & Tremblay, 2001). For

example, Cote et al. (2007) found that having a mother who had not graduated from high school was a risk factor for a physically aggressive trajectory.

The Current Study

The overall purpose of the current study was to examine how aggression in preschool children is related to a child's social-information processing, language skills, and emotion knowledge. Because recent research has emphasized the importance of examining relational aggression (e.g., Crick & Zahn-Waxler, 2003; Crick et al., 2004), in addition to more traditional definitions of aggression, both relational and physical aggression were explored in the current study. The current study fills an important research gap in the area of social-information processing at Step 2. To the author's knowledge, this is the first study to incorporate both relational and physical ambiguous situations with preschool children and is the first to attempt to replicate Crick et al.'s (2002) finding of links between gender-specific types of aggression and gender-specific social-information processing stimuli with children this young. Furthermore, the ambiguous situations are designed such that they are either relationally aggressive or physically aggressive (instead of the broader category of overt aggression). In addition, Steps 4 and 5 of the social-information processing model were explored by asking children what they would do in the given situations, thus asking them to generate possible responses to both the physical and relational provocations and to choose a response. The current study is among the first to explore the contributions of language skill and affective-perspective taking to both relationally and physically aggressive behaviour. Additionally, the current study was the

first to incorporate parent-reported measures of relational aggression, rather than relying solely on teacher-reported aggression.

Hypotheses

It was expected that:

- 1) Gender would be associated with gender differences, such that boys would be higher in physical aggression and girls would be higher in relational aggression.
- 2) Intent attributions in ambiguous situations would be associated with aggressive behaviour, such that a) tendency to assume hostile intent in physical situations would be related to and would predict physical aggression, and b) tendency to assume hostile intent in relational situations would be related to and would predict relational aggression.
- 3) Proposed reactions to ambiguous situations would be associated with aggression, such that a) suggesting and choosing aggressive responses to physical situations would be related to and will predict physical aggression, b) suggesting and choosing aggressive responses to relational situations would be related to and would predict relational aggression.
- 4) Affective-perspective taking skills would be negatively associated with physical aggression and would be positively associated with relational aggression.
- 5) Language skill would be related to aggression, such that a) language skill would be negatively associated with physical aggression and b) language skill would be positively associated with relational aggression

CHAPTER 2

METHOD

Recruitment

Participants were recruited to take part in a larger study investigating the psycho-social correlates of young children's social skills. Parents were invited to take part in the study through postings on websites targeting Windsor area parents, brochures distributed through daycares, the Windsor Essex-Catholic School Board, Saint Mary's Learning Centre, Children First, day camps and recreation programs at Windsor Recreation Centres, signs in businesses, and public libraries. Recruitment sources from which at least one participant was recruited are summarized in Table 1 in Appendix A. Data was collected from teachers via parents. Parents were given stamped envelopes pre-addressed to the university which contained letters of information, consent forms, and questionnaires for teachers, along with a \$5 TimCard. Teachers then completed the questionnaires and mailed them in the envelopes provided.

Table 1.

Total Number of Participants Recruited from Each Source

Source	N (Percentage)
Websites	25 (50%)
Mom2Mom	22 (44%)
Kijiji	3 (6%)
Word of Mouth	21 (42%)
From Researchers	16 (32%)
From Other Participants	5 (10%)
Community Organizations	4 (8%)
Saint Mary's Learning Centre	2 (4%)
Children First	1 (2%)
Windsor Essex Catholic District School Board	1 (2%)

Participants

Participants included 50 children from the Windsor-Essex community and their mothers. There were 28 boys and 22 girls. Children ranged in age from 3 to 6 years ($M = 4$ years, 7 months, $SD = 1$ year; $Range = 41$ months), and age was similar for boys ($M = 4$ years, 6 months, $SD = 1$ year) and girls ($M = 4$ years, 10 months, $SD = 1$ year).

Most of the children were Caucasian/White ($N = 39$; 78%). Six children were Biracial or Multi-racial as follows: 1 Biracial South Asian Caucasian child, 2 Biracial East Asian Caucasian children, 1 Biracial African-Canadian Caucasian child, 1 child whose mother was Caucasian and whose father was Biracial (ethnicities unspecified), and 1 child whose mother was Biracial (ethnicities unspecified) and whose father was African-Canadian. One child was South Asian. The mothers of four children classified their ethnicity as “other.”

Most of the children attended some type of school. The majority attended preschool ($N = 16$; 32%) or Junior Kindergarten ($N = 15$; 30%). Nine children (18%) attended Grade 1. Three children (6%) attended day care or another type of non-school-related child care. One child did not attend any type of schooling or day care. Educational data was not available for 4 children (8%).

Forty-four mothers participated in the current study and 6 of them had two children who participated. Parental education information was available for 39 fathers and 39 mothers. Seven fathers (18%) had attended graduate or professional school, 19 (48%) graduated from college or university, 9 (23%) had some college or university and 4 (10%)

graduated from high school. Fourteen mothers (36%) attended graduate or professional school, 22 (56%) graduated from college or university, and 3 (8%) had some college or university education.

Occupational data was available for 39 fathers and 39 mothers. The majority of mothers ($N=14$, 36%) worked as teachers. Nine (23%) mothers worked in healthcare, 2 (5%) worked in business, 3 (7%) worked in retail, 2 (4%) were students, 1 (2%) was a lawyer, 1 (2%) was an event planner, 1 (2%) was a receptionist, and 6 (15%) described themselves as unemployed or stay-at home mothers.

The most common occupation among fathers was engineering ($N = 7$, 18%), followed by factory work ($N = 6$, 15%), business ($N = 5$, 13%), computers ($N = 5$, 13%), construction ($N = 3$, 8%), general labour ($N = 4$, 10%), political work ($N = 2$, 5%), healthcare ($N = 2$, 5%), firefighting ($N = 1$, 3%), education ($N = 1$, 3%), music ($N = 1$, 3%), self-employed ($N = 1$, 3%), and unemployed ($N = 1$, 3%).

Mothers were asked to provide the total annual combined income in their household. This data was available for 38 families. Four (10%) reported an income under \$30 000, 6 (15%) reported an income between \$30 000 and \$60 000, 12 (31%) reported between \$61 000 and \$100 000, 12 (31%) reported an income between \$101 000 and \$150 000, 3 (8%) reported an income between \$151 000 and \$250 000, and 1 (3%) reported an income over \$251 000.

The vast majority of children lived in two-parent homes in which their mothers and fathers were married to each other ($N=46$; 90%). Two children (4%) lived in homes in which their mothers and fathers were living common-law relationships with each other. Marital data was not available for 2 participants.

Information on psychological and physical health was available for 45 children. Mothers were asked to indicate whether their children had been diagnosed with a psychological disorder or learning disability. The majority of mothers ($N = 44$; 88%) indicated that their children had not been diagnosed with disorders. One child had been diagnosed with a learning disability. Mothers were also asked to indicate whether their children had any severe illnesses. Two mothers indicated that their children had asthma, but no other illnesses were named. In terms of medications, 2 children took oral asthma medications and 2 other children used inhalers for asthma. Another 2 children took medications for gastrointestinal difficulties.

Nineteen teachers filled out questionnaires regarding 19 children in the current study. Teachers worked at 15 different schools or childcare facilities. In addition, 2 teachers worked in at-home settings. One provided in-home childcare and another was a home educator who was also one of the children's fathers. In terms of gender, 18 of the teachers were female and one was male.

Children's intelligence was assessed using the Wechsler Preschool and Primary Scale of Intelligence, Third Edition and the Kaufman Brief Intelligence Test, Second Edition, as described in the Measures section. Intelligence data was not available for 7 participants. If intelligence data was missing, but language scores were at least in the Average range and parents reported no concerns about developmental delays, then, the children's data were included. This is because language and intelligence are highly correlated (Sattler, 2004) so it would be unlikely for a child to have an intellectual disability and score in the average range on a comprehensive assessment of intelligence, especially if his or her mother did not report any concerns. Intelligence data is presented in Table 2.

Table 2.

Estimates of Intelligence Using Subtests from the WPPSI-III and the KBIT-II

Intelligence Measure	<i>N</i>	<i>M</i>	<i>SD</i>
KBIT-II Standard Scores			
Full-Scale Composite	31	107.06	12.59
Nonverbal Scale	31	102.19	13.36
Verbal Scale	31	108.06	13.49
WPPSI-III Scaled Scores			
Block Design	4	8.75	4.57
Object Assembly	8	10.00	2.61
Information	11	11.54	2.66

Measures

Demographics Questionnaire. Children's mothers completed a demographics questionnaire, which gave demographic information including: age of child, grade of child, gender of child, ethnicity, parents' marital status, number of siblings, child's birth order, child's diagnoses, child's suspected diagnoses, and child's temperament as an infant. Parents' socioeconomic status was assessed by parents' occupations, highest level of parents' education, and approximate annual income of parents. Additionally, mothers were asked to describe what they would tell their children to do if they were victims of physical and relational aggression, and were given an opportunity to provide additional information if they chose to do so. This questionnaire is presented in Appendix A.

Kaufman Brief Intelligence Scale, Second Edition (KBIT-II; Kaufman & Kaufman, 2004). The KBIT-II is a brief, standardized measure of intelligence for individuals 4 through 90 years. It consists of three subtests (Verbal Knowledge, Riddles, and Matrices) that yield verbal, nonverbal, and overall IQ scores. On the Verbal Knowledge task, children are presented with a series of pictures and are asked to point to the picture that matches a word given by the examiner. The Matrices subtest requires the child to choose a picture to complete a pattern, given a series of options. The Riddles subtest requires a child to point to certain pictures to provide information or to answer simple factual questions orally. The KBIT-II has acceptable psychometrics (Madle & Shaw, 2004). Its internal consistency coefficient for the overall IQ Composite is .93; which is considered very good, and its consistency coefficients for the Verbal and Nonverbal scales are .91

and .88; which are within acceptable ranges. The test-retest reliability was .90 and results were similar for the Verbal ($r = .91$) and Nonverbal ($r = .83$) scales. In addition, the KBIT-II has concurrent validity with the Wechsler scales, although results suggest that the KBIT-II may slightly underestimate intelligence, especially among gifted children (Madle & Shaw, 2004).

The KBIT-II was used to measure the intelligence of children ages 4 to 6 in the current study. Children who received an IQ Composite score that was at least in the Low Average range (80 or above) were included in the study. Additionally, children who scored at least in the Low Average range (Standard Score of 80 or above) for the Nonverbal Scale of intelligence were included in the analyses (even if they scored lower than 80 on the Verbal scale). This cut-off was chosen because the other subtests require verbal skill, and language delays might cause the overall IQ score to be low despite a child's adequate nonverbal skills.

Wechsler Preschool and Primary Scale of Intelligence, Third Edition (WPPSI-III, Wechsler, 2002). The WPPSI-3 is an intelligence scale designed for children as young as 3 years. Since the 3-year-olds in the current study were too young to complete the KBIT-II, they completed two subtests from the WPPSI – a nonverbal subtest (either Block Design or Object Assembly) and a verbal subtest (Information).

Block Design requires children to arrange blocks to copy a model of blocks presented by the examiner and then to arrange blocks to copy a series of pictures shown to the child by the examiner under a time limit. This task is considered quite reliable with reliability coefficients at or above 0.75 at each age range (Sattler, 2004). It also has a moderately high correlation with Full Scale IQ ($r = .71$).

In some cases, Object Assembly was used as a measure of nonverbal intelligence, instead of Block Design. The reason for the change is that children had some difficulty completing the Block Design task because it requires some self-control that can be difficult for a younger 3-year-old. It requires being given blocks and inhibiting the probable desire to build something with the blocks on one's own and to instead copy the design of the examiner. Object Assembly seems more enjoyable to some 3-year-olds because it is set up like a jigsaw puzzle, which is something that may be familiar and also because assembling the pieces to make a picture that looks like an animal or other interesting object can be more rewarding than putting blocks together to look like a meaningless design. In addition, Object Assembly and Block Design are fairly highly correlated with each other; $r = .44$ (Sattler, 2004). Object Assembly requires children to put a series of shapes together to form an overall picture (like a jigsaw puzzle) under a time limit. Object Assembly is a reliable subtest, with reliability coefficients at or above .78 at all age levels.

Information requires children to name everyday objects and to answer factual questions orally. Questions refer to a variety of topics including body parts, names of animals, uses of objects, and calendar information. Information is considered a reliable subtest, with reliability coefficients at or above .83, at all ages.

Children for whom the average of the two subtests was at least in the low average range (i.e., means of the scaled scores greater than or equal to 8) were included in the current study.

In one case, an exception was made to this criterion. The data of a child who received a low score on the Block Design subtest was included in the current study because the

child's poor performance on this subtest was due to his distractibility and not to low intelligence. This was clear because he continuously moved during the subtest and refused to remain in his seat for more than a few minutes, but he received scores in the average range and above on all subtests of the Clinical Evaluation of Language Fundamental Preschool, Second Edition, which is correlated with intelligence (Wiig et al., 2004).

Social-Information Processing Measure (SIP Measure). To assess children's social-information processing, a story task was used. Children were introduced to two puppets named Aaron (Erin) and Alex. The gender of the puppet was matched to that of the child. Children were told that the puppets always disagree and were given two examples. One puppet said, "I don't like candy," and the other puppet said, "I like candy." The researcher asked, "What about you? Do you like candy?" The child responded orally and was then asked to point to the puppet that he or she agreed with (almost always the puppet that likes candy). Then, the puppet who did not like candy said, "I have a TV," and the puppet who did like candy said, "Not me, I don't have a TV." The child was asked, "What about you, do you have a TV?" The child answered orally and was asked to point to the puppet that the child agreed with (always the puppet that had a TV). If the child did not point to the correct puppet, the child was corrected; for example, with a statement like, "You said you like candy and this puppet likes candy so you should point to this puppet." If the child made a mistake or if the child agreed with the same puppet twice, this procedure was repeated using different statements until the child had pointed correctly to each of the puppets. This puppet technique was based on a procedure originally developed by Eder (1990) and modified by Werner et al. (2006).

After the children were familiarized with the puppets, they were presented with 8 vignettes. Children were told, “Now, we are going to listen to some stories on the computer. I want you to pretend that you are the person in the story. Aaron (Erin) and Alex are going to listen to the stories too. Then, I am going to ask you some questions about the stories.” Children then listened to eight vignettes presented on a laptop. The audio for each of the eight stories was pre-recorded and was presented along with a cartoon picture illustrating the plot of each story.

All children listened to the same audio-recording of the story; but the cartoons were matched to the child’s gender and skin colour. There were 4 pictures for each story: a picture depicting a White boy, a picture depicting a White girl, a picture depicting a boy with darker skin, and a picture depicting a girl with darker skin. The choice to match the picture that a child looks at with the child’s skin colour was made because of evidence suggesting that children hold biases towards people of other races in ambiguous situations (e.g., Brown & Bigler, 2005; Margie, Killen, Sinno, & McGlothin, 2005).

Six of the stories were adapted by the current author from vignettes described by Crick et al. (2002) and received from Crick directly (personal correspondence, 2008). The six vignettes adapted from Crick et al. (2002) include: The Playground Story, The Standing Story, The Shoes Story, The Race Story, The Party Story, and The Puzzle Story. The two vignettes written by the current author include The Colouring Story and The Tag Story. All eight of the vignettes are presented in Appendix B, along with their corresponding illustrations. Each vignette described an ambiguous situation in which one child interacted with another child. In each vignette, some type of harm is caused, but it is unclear whether the harm was caused on purpose or whether it was accidental. Four of the

vignettes contain situations in which possible physical aggression occurs and four of the vignettes contain situations in which possible relational aggression occurs. The order of the vignettes was randomized using a Powerpoint Macro specifically designed for this purpose.

Physical vignettes include those in which possible physical harm has been caused. An example of a physical vignette is called “The Colouring Story.” It reads:

Pretend that you are at school colouring a picture. You want to use the red crayon. You ask a kid, “could you pass me the red?” The kid throws the red crayon toward you. It hits your head and it hurts.

Relational vignettes include those in which possible harm has been caused to a person’s relationships, such as being the subject of gossip, or being ignored. An example of a relational vignette is called “The Party Story.” It is as follows:

Pretend that you are at school one day. Two other kids from your class start talking to each other. You hear one of the kids invite the other one to a birthday party. The kid says that there are going to be a lot of people at the party. You have not been invited to this party.

After hearing this vignette, one of the puppets said “I think that is mean,” and the other puppet said, “I don’t think it is mean,” and the child was asked to point to the puppet with whom the child agreed. The order of the puppets was randomized so that sometimes the puppet who said, “I think that is mean,” spoke first and sometimes the puppet who said, “I don’t think that is mean,” spoke first. In addition, the puppets’ points of view were randomized so that each puppet said “I don’t think that is mean,” an equal number of times as it said, “I think that is mean.” Hostile attributions were defined by the number

of times a child agreed with the puppet who said “I think that is mean.” Scores for hostile attributions to relational stories could range from 0 to 4 and scores for hostile attributions for physical stories could also range from 0 to 4.

After pointing to the puppet with whom the child agreed, the child was asked the open-ended question, “What would you do if that happened to you?” The child’s response was recorded verbatim. This process was repeated for each vignette. If a child responded, “I don’t know,” or “nothing,” the child was prompted with, “What do you think you might do?” In addition, if a child responded by describing a thought or a feeling, for example, “That would hurt,” or “I would think it’s mean,” the child was prompted with, “and what do you think you might do?” If a child began talking off-topic, he or she was asked the question again.

After the first 12 children participated, it became clear that more children had a tendency to say, “I don’t know,” than originally anticipated. As a result, a second forced-choice part of the task was introduced. If the child said “I don’t know,” or “nothing,” again after being queried once, then a star was placed next to this story. Then, after going through all of the eight stories, the stories or story to which the child replied “nothing” or “I don’t know” or another non-action responses, the story was played again and children were given 4 options of what they might do: a physically aggressive response, a relationally aggressive response, a prosocial response, and a do-nothing response. Children were only given these options if they did not come up with a response on their own. The four options for each of the eight stories are presented in Appendix C. Responses were classified as physically aggressive, relationally aggressive, prosocial, aggressive but not relationally or physically aggressive, suggestion to involve an adult to

punish the child physically, suggestion to involve an adult to punish the child in some way other than physically (e.g., timeout), involvement of an adult with no mention of punishment, withdrawal, prompted physically aggressive (i.e., the child initially said “I don’t know” or “nothing” and then chose the physically aggressive response when provided with options), prompted relationally aggressive (i.e., the child initially said “I don’t know” or “nothing” and then chose the relationally aggressive response when provided with options), prompted prosocial (i.e., the child initially said “I don’t know” or “nothing” and then chose the prosocial response when provided with options), prompted do nothing (i.e., the child initially said “I don’t know” or “nothing” and then chose the do-nothing response when provided with options), and other. To examine the initial effectiveness of the description of the codes, 20% of the coding was done by a co-researcher, in addition to the current author. Out of 80 responses (10 participants with 8 responses each), there was an agreement rate of 90%. Through discussion, the discrepancies were resolved and the coding guidelines were modified to become clearer. Then, an independent coder coded another 20% of the responses using the new refined coding guidelines. The resulting percent agreement was 94.94% (*Cohen’s K* = 0.928; 95% confidence interval: From 0.858 to 0.997). . The coding guidelines are presented in Appendix D.

To examine the degree to which hostile attribution scores for the four relational and the four physical situations were internally reliable, Cronbach’s alpha values were calculated. Cronbach’s alpha for hostile attributions for physical situations was .68 and for relational situations, it was .83. The internal consistency of aggressive responses across the four physical situations and the four relational situations was also examined.

The resulting Cronbach's alpha values were .76 for physical situations and .66 for relational situations. Analyses revealed that internal consistency would not improve if any of the stories were removed and therefore, all of the stories were included.

Affective-Perspective Taking Task. To assess affective perspective-taking, a task reported by Werner et al. (2006) based on adaptation of a task originally created by Denham (1986) was used. First, each child was presented with a puppet named Jamie whose gender was matched to the gender of the child. Then, the child was shown four faces depicting facial expressions that be placed on the puppet's head: happy, sad, angry, and afraid. Then, the child was asked to identify the emotions expressed by the four facial expressions. If a child made a mistake in labeling the emotions expressed by the different facial expressions, this was documented and children were corrected until they could appropriately identify all four emotions. Next, the child was presented with a series of stories about the puppet. The stories contained four instances (one for each emotion) in which the puppet experienced emotions similar to what a typical child would experience. In addition, the stories contained four instances (one for each emotion) in which the puppet experienced an unusual response. For example, in an expected emotion situation, the protagonist in the story is portrayed as feeling happy because he received a gift. In an unexpected emotion story, the protagonist feels happy about going to the doctor to get a shot (based upon the protagonist's desire for the lollipop that always comes after the shot).

For each story, the child was presented with the four face options depicting happy, sad, angry, and afraid emotions. The child was asked how the puppet felt, and the child was asked to respond by placing the appropriate face on the puppet. Eight stories were

presented to each child. Children were given 1 point for pointing to the correct facial expression when asked to name the different emotions. For each story, children were given 2 points if they were able to identify the appropriate emotion. If they did not correctly identify the emotion depicted by a particular story, but the emotion that they chose was of the same valence of the correct emotion (i.e., sad, angry, and afraid are all negative valence, whereas happy is positive valence), then they were given 1 point. Children were given 1 additional point if they were able to give the correct reason for the puppet's emotion. Therefore, children's total scores for the Affective-Perspective Taking (APT-Total) Task could range from 0 to 28. The internal consistency score for this scale in the current study was acceptable (Cronbach's $\alpha = .88$).

The APT-Total measures children's ability to label emotions in a story and to give reasons for the emotions (i.e., children's ability to correctly answer, "how does Jamie feel?" and also "why does she or he feel like that?"). In addition, a separate scale was used to measure children's ability to simply label emotions, with their ability to explain the reasoning behind the emotions not included (APT-Emotion Identification; i.e., children's ability to correctly answer "how does Jamie feel?" with their responses to "why does she or he feel like that" not included). These scores can range from 0 to 20. The internal consistency score for this scale in the current study was somewhat low (Cronbach's $\alpha = .62$).

Clinical Evaluation of Language Fundamentals Preschool, Second Edition (CELF-Preschool 2; Wiig, Secord, & Semel, 2004). Children's language skills were measured using the CELF-Preschool II. It is a standardized test that assesses the basic foundations of language use. It includes measures of expressive and receptive language and language

structure and content. Subtests used in the current study were: Concepts and Following Directions, Word Structure, Expressive Vocabulary, Recalling Sentences, Sentence Structure, Basic Concepts (for children in the study who were 4 years old and under), and Word Classes (for children in the study who were 5 years old and over). The Sentence Structure task evaluates a child's ability to interpret spoken sentences of increasing length and complexity by pointing to a picture from a series of 4 options that corresponds to a sentence given by the examiner. The Word Structure subtest requires children to complete sentences started by the examiner. It evaluates the child's ability to apply word structure words to mark inflections, derivations, and comparison and to select and use appropriate pronouns to refer to people, objects, and possessive relationships. The Expressive Vocabulary subtest evaluates a child's ability to label illustrations of people, objects, and actions. Children are shown a series of pictures and are asked to say what the picture is or what the person in the picture is doing. The Concepts and Following Directions subtest requires to point to pictures in the order described by the examiner after the examiner says "go," (and not before). The task assesses a child's ability to evaluate spoken directions of increasing length and complexity, remember the names, characteristics, and order of pictures, and identify the target choices from several similar choices. The Recalling Sentences task evaluates the child's ability to listen to spoken sentences of increasing length and complexity and to repeat them without changing the meaning or structure of the sentence. The Basic Concepts subtest (used for children ages 4 years and under) evaluates a child's knowledge of concepts of dimension and size, direction, location, position, numbers and quantities, and equality. Children are required to demonstrate their understanding by pointing to the correct target out of four similar

options. The Word Classes subtest (for children 5 years and over) evaluates the child's ability to perceive relationships between words that are related by semantic class.

Children are presented with 3 or 4 pictures and are asked to choose 2 pictures that go together and to explain how the words go together. Word Classes has a receptive score which refers to the child's ability to say which words go together and it also has a total score, which refers to the combination of the child's ability to say which words go together and the ability to indicate the reason for the grouping.

These subtests load onto one overall scale and 4 indexes. The overall scale is called the Core Language Scale (CLS). The four indexes are Expressive Language Index (ELI), Receptive Language Index (RLI), Language Content Index (LCI), and Language Structure Index (LSI). The ELI measures how well children can express themselves orally, whereas the RLI measures how well a child can understand language. Furthermore the LSI measures a child's understanding of how to use correct word structure (morphology) and sentence structure, whereas the LCI measures a child's semantic understanding or general knowledge of the meaning of words. The CLS is made up of the Word Structure, Sentence Structure, and Expressive Vocabulary subtests. The ELI is made up of the Word Structure, Expressive Vocabulary, and Recalling Sentences subtests. The RLI is made up of the Sentence Structure, Concepts and Following Directions, and Basic Concepts scales for children 4 years and under and for children 5 and over, it is made up of the Sentence Structure, Concepts and Following Directions, and Word Classes-Receptive. The LSI is made up of the Sentence Structure, Word Structure, and Recalling Sentences subtests. Finally, the LCI is made up of the Expressive Vocabulary, Concepts & Following Directions, and Basic Concepts subtests for children

4 years and under and for children 5 and over, it is made up of the Expressive Vocabulary, Concepts & Following Directions, and Word Classes-Total scales.

The psychometric properties of the CELF Preschool II are excellent according to the analyses described in the CELF Preschool II manual (Wiig et al., 2004). Test-retest reliability coefficients are 0.87 or more for every index, with reliability increasing as children get older. In addition, internal consistency measures with coefficient alpha reliability coefficients are very high; at least 0.90 in every age used in the current study. Using the split-half method, reliability is even higher, at least 0.92 for all indexes among ages used in the current study. In addition, the CELF Preschool II has excellent concurrent validity, as it is highly correlated with the Clinical Evaluation of Language Fundamentals, Fourth Edition (Semel, Wiig, and Secord, 2003), and with the Preschool Language Scale, Fourth Edition (Zimmerman, Steiner, & Pond, 2002). Furthermore, evidence suggests that it has excellent construct validity based on factor analysis, structural equation modelling, and its ability to discriminate between children with and without language disorders and autism spectrum disorders and its diagnostic accuracy (Wiig et al, 2004).

The CELF Preschool II also has a Pre-Literacy Rating Scale (PLRS) and a Descriptive Pragmatics Profile (DPP). These scales are parent-report checklists that measure a child's skills related to preparing to learn to read (such as print awareness), and skill required for the practical application of language use (pragmatics). Parents rate a series of skills from 1 (Never) to 4 (Always) to describe the degree to which the child has that skill. In addition, parents can indicate "Not Appropriate" if they think that a certain item should not apply to their children because of cultural or other reasons.

Both of these scales are considered reliable (Wiig et al., 2004). The PLRS has a test-retest reliability correlation of .89 across the ages and an internal consistency coefficient alpha of .95. The DPP has a test-retest correlation of .87 across the ages and an internal consistency coefficient alpha of .95.

Preschool Social Behaviour Scale (PSBS, Crick et al., 2007). The PSBS consists of 25 items that assess overt aggression, relational aggression, prosocial behaviour, depressed affect, and acceptance with peers. Since the current study focused on physical aggression, rather than the broader overt aggression, 2 additional items were added to the scale to assess physical aggression. These are “This child pokes peers,” and “This child punches peers.” Respondents were asked to fill out the entire form, but the items assessing relational and physical aggression are the focus of the current investigation. Respondents read the phrases and were asked to rate the degree to which the given child engages in these behaviours. The response scale for each item ranges from 1 (*never or almost never true of this child*) to 5 (*always or almost always true of this child*). Research has provided support for the psychometric properties of the PSBS (e.g., Bonica et al., 2003; Crick et al., 1997; Hart et al., 1998; Ostrov & Keating, 2004). Teachers’ responses to this measure have been shown to be reliable, with Cronbach’s alpha above .90 for both the relational and overt aggression scales (Crick et al. 1997).

Interestingly, no known studies to date have used parent-report as a means of measuring relational aggression among young children. Even though parents may not be able to observe many of the aggressive interactions that occur in the classroom, they are also likely privy to certain aggressive behaviour that children choose to enact at home. In the current study Crick et al.’s (1997) Preschool Social Behaviour Scale – Teacher Form

was used with both teachers *and* parents. The forms for teachers and parents were identical except that the Teacher Form was called PSBS-TF and the Parent Form was called PSBS-PF. The PSBS and the scales used in the current study are presented in Appendix E.

To examine the internal consistency of the relational aggression and physical aggression items scales on the PSBS-PF and PSBS-TF, Cronbach's alpha values were calculated. Results revealed that the 7 physical aggression items had Cronbach's alpha values of .77 for parent-reported physical aggression and 0.60 for teacher-reported physical aggression. This low reliability for teacher-reported physical aggression is due to the fact that only a small number of teachers completed this questionnaire ($N = 20$). For relational aggression, Cronbach's alpha values were 0.66 for parent-reported relational aggression and 0.89 for teacher-reported relational aggression.

Child Behaviour Checklists (CBCLs; Achenbach & Rescorla, 2000; 2001). The CBCL is a parent-report measure that assesses a variety of internalizing and externalizing problems, as well as adaptive skills among children. This scale was used to assess physical aggression in the current study. Two versions of the CBCL were used in the current study: the CBCL 1½-5 (designed for children ages 1.5 years to 5 years), and CBCL 6-18 (designed for children ages 6 to 8 years). The CBCL Parent Report 1½-5 contains 100 items and parents are asked to rate the degree to which they believe each item is true about their children's behaviour within the past 2 months on a scale from 0 (*not true*) to 2 (*very true or often true*) and are given the opportunity to add 3 additional items. The CBCL Parent Report contains 113 items, plus three additional open-ended entries that respondents could use to include problems not already listed. Parents were

asked to rate the degree to which they believed each item on the CBCL was true about their child's behaviour within the past 2 months on a scale from 0 (*not true*) to 2 (*very true or often true*). An analysis of the CBCL items revealed that only 3 items for each version actually measure physical aggression. For the 6-18 version, these items were: "Cruelty, bullying, or meanness to others", "Gets in many fights", and "Physically attacks people," and for the 1 ½ - 5 version, these items were: "Gets in many fights," "Hits others," and "Physically attacks people." Physical aggression CBCL scores were totals of these three items. Even though the CBCL has its own Aggression scale, this scale was not used because it is made up of a number of items that are not actually physical aggression (e.g., being loud, disrupting others). The CBCL does not have any items that are appropriate for measuring relational aggression.

The CBCL 6-8 (Achenbach & Rescorla, 2001) has been found to have good validity and reliability. The range of test-retest reliability for this scale has been reported between 0.95 and 1.00; the range of inter-rater reliability has been reported at 0.93 to 0.96; and the range of internal consistency has been reported at 0.78 to 0.97 (Achenbach & Rescorla, 2001).

Likewise, the psychometric properties of the CBCL 1½ - 5 are considered to be very good. Test-retest reliabilities range from .74 to .92, with most values being in the .8 range. Furthermore, Achenbach & Rescorla, (2000; 2001) reported that the criterion validity of the CBCL 1½ - 5 and the CBCL 6-18 can be considered good since they distinguish between referred and non-referred children and since the DSM scales are highly related to DSM diagnosis. In addition, their concurrent validity is good since they have been correlated with other widely-used behaviour checklists, such as the Behaviour

Assessment System for Children, Second Edition (BASC-2; Reynolds & Kamphaus, 2004).

Teacher Report Form (TRF; Achenbach & Rescorla, 2000, 2001). Two versions of the Teacher Report form were used in the current study: Teacher Report Form 1 ½-5 and Teacher Report Form 6-18. The Teacher Report Form 1½-5 contains 100 items and teachers are asked to rate the degree to which they believe each item is true about the student's behaviour within the past 2 months on a scale from 0 (*not true*) to 2 (*very true or often true*) and are given the opportunity to add 3 additional items.

The Teacher Report Form 6-18 is very similar. Teachers were asked to rate the degree to which they believe each item on the Teacher Report Form 6-18 is true about the pupil's behaviour within the past 2 months on a scale from 0 (*not true*) to 2 (*very true or often true*). This report also contains 113 items, plus three additional open-ended entries that respondents may use to include problems that are not already listed. An analysis of the TRF items revealed that it also has very few items that measure physical aggression; only 3 items for each version actually measure physical aggression. They are the identical items used to measure physical aggression on the CBCL. For the 6-18 version, these items were: "Cruelty, bullying, or meanness to others", "Gets in many fights", and "Physically attacks people," and for the 1 ½ - 5 version, these items were: "Gets in many fights," "Hits others," and "Physically attacks people." Physical aggression TRF scores were totals of these three items.

The Teacher Report Form 1 ½-5 form also has psychometrics within acceptable ranges. Test-retest correlations range from .57 (for Anxiety) to .91 (for Somatic Complaints), with most correlations being in the .8 range. Furthermore, the TRF 1 ½-5

has been found to have good criterion validity in distinguishing between children with and without diagnoses, except on the Somatic Complaints scale (Achenbach & Rescorla, 2000).

The TRF 6-18 also has a high degree of test-retest reliability, ranging from .71 to .95, with most values being in the high .8 to low .9 range. Additionally, internal consistency values are acceptable, ranging from .72 to .97, with most values being in the .9 range. In addition, Achenbach and Rescorla (2001) report that the TRF 6-18 has been found to have good criterion-validity in distinguishing between referred and non-referred children and is highly correlated with other teacher-report checklists, such as the BASC-2 (Reynolds & Kamphaus, 2004).

Procedure

Children and their mothers visited the university on two occasions for about 1½ to 2 hours each time. During the first visit, children and their parents played with some toys together and became comfortable in the environment. Then, the children worked one-on-one with a researcher and either completed the CELF-Preschool-2 or “the puppet tasks” (the social-information processing and affective-perspective taking task). The order was randomized so that sometimes children completed the CELF-Preschool-2 in the first session and sometimes it was done in the second session. While children were working one-on-one with a researcher, mothers remained in the next room where they filled out questionnaires and had an opportunity to ask questions to another researcher. At the second session, children completed the K-BIT-2 and either the CELF-Preschool-2 or “the puppet tasks,” while the mothers completed additional questionnaires.

The social-information processing and affective-perspective taking tasks were presented together. The social-information processing task was always presented first because it involved the use of the laptop and seemed the most engaging to the children. This reduced the likelihood that the child would want to leave the room immediately. After listening to the stories on the laptop, the children tended to become settled and were prepared to engage in the less interesting (though still enjoyable) affective-perspective-taking task.

Midway through each session, children were provided with juice and snacks. Each time children worked one-on-one with a researcher, they were given a blank piece of paper and some crayons and were allowed to draw and/or write their name on the paper. Then, as they completed each task, they were given a choice of several stickers to put on their paper as a reward for listening and trying their best. At the end of each session, children proudly presented their pictures to their mothers and took them home. At the end of each session, children were also given a choice of a small prize as a thank-you. Throughout both sessions, children were repeatedly told that they were doing a good job and were thanked for trying their best. In addition, children were given an opportunity to play with the puppets if they wanted to do so. At the end of the first session, mothers were given \$10 and at the end of the second session, mothers were given a \$5 TimCard (for Tim Horton's) as a thank-you. Parents were provided with developmental screeners/reports describing their children's social skills and language skills and these were mailed to parents a few weeks after the end of the second session.

CHAPTER 3

RESULTS

Preliminary Analyses

Fifty children participated in the current study, but not all data was available for all children. This is because children were asked to visit the university on two separate occasions. In some cases, children visited the university only once and did not return to complete the rest of the measures, despite efforts to invite them back. In some cases, children were too tired or distractible to complete all of the measures and thus data was not collected on certain measures.

The data were analyzed for normality and absence of outliers by examining histograms and skewness and kurtosis statistics for all variables to be used in the current study. Using a criteria of plus or minus 3 for Skewness and Kurtosis statistics, as described by Garson (2008), all of these variables were found to be normally distributed and without extreme outliers except for the CELF Preschool 2 Receptive Language Index (RLI; *Skewness* = -1.77; *SE Skewness* = .39; *Kurtosis* = 4.63; *SE Kurtosis* = .77), PSBS-PF Physical Aggression (*Skewness* = 2.04; *SE Skewness* = .36; *Kurtosis* = 4.94; *SE Kurtosis* = 0.71), PSBS-TF Physical Aggression (*Skewness* = 2.60; *SE Skewness* = .52; *Kurtosis* = 7.86; *SE Kurtosis* = 1.01), and TRF Physical Aggression (*Skewness* = 2.80; *SE Skewness* = .52; *Kurtosis* = 6.51; *SE Kurtosis* = 1.01).

To attempt to make RLI more normal, all values that were more than 2 standard deviations above or below the mean were changed to two standard deviations above the mean plus one or two standard deviations below the mean minus one. Two cases were

below two standard deviations below the mean and no cases were above two standard deviations above the mean. This resulted in a more normal distribution for the RLI; *Skewness* = -.86, *SE Skewness* = .39; *Kurtosis* = 1.25, *SE Kurtosis* = 1.26.

The reason why the TRF Physical Aggression scale was not normal was because there were only 19 children for whom TRF Physical Aggression scores were available and values only ranged from 0 to 1. Therefore, there were no appropriate transformations that could be done to make the scores more normal and the TRF Physical Aggression scale was instead interpreted with caution.

The PSBS-PF Physical Aggression and PSBS-TF Physical Aggression scales were transformed by finding the log of each and this resulted in more acceptable levels of skewness and kurtosis (For PSBS-PF Physical Aggression: *Skewness* = 1.33, *SE Skewness* = .36; *Kurtosis* = 1.90, *SE Kurtosis* = .71, and for PSBS-TF Physical Aggression: *Skewness* = 2.08, *SE Skewness* = .52; *Kurtosis* = 4.83, *SE Kurtosis* = 1.01).

To check for the assumption of linearity, scatterplots were used as suggested by Field (2005). Each measure of aggression (PSBS-PF Physical Aggression, CBCL Physical Aggression, PSBS-PF Relational Aggression, PSBS-TF Physical Aggression, PSBS-TF Relational Aggression, TRF Physical Aggression) was plotted against each other variable with which it was correlated, including each measure of language skill (CLS, ELI, RLI, LCI, LSI, PPI, PLRS), each measure of Affective-Perspective Taking (Total APT and APT EI), each measure of hostile attributions (those for relational stories and those for physical stories) and each measure of aggressive responses (aggressive responses to physical situations, aggressive responses to relational situations). Scatterplots revealed acceptable linearity for all combinations of variables.

In all instances, when t-tests were conducted, Levene's Test for Equality of Variances was examined, and if Levene's Test was significant, indicating heterogeneity of variances, the t-test values for homogeneity of variance not assumed were used. Unless otherwise specified, the assumption of homogeneity of variances was met in the t-test analyses conducted.

As mentioned, a forced-choice aspect of the social-information processing task (that is, following up I-don't-know statements with a choice of 4 possible responses) was added after 12 children had already participated in the study. To ensure that this change did not bias the results, a t-test was run comparing the aggressive responses of children who were not given the forced-choice follow-up and the children who were given the forced-choice follow-up. Results showed no significant differences between groups for aggressive responses to physical situations, $t(40) = -.73, p = .47$, or relational situations, $t(40) = -1.38, p = .18$.

Unfortunately, data from teachers was only received from 19 participants. As a result, teacher- and parent-reported data could not be combined into composites, but were tested separately. Nevertheless, teacher and parent-reported aggression were compared. In fact, several measures of parent- and teacher-reported physical aggression and parent- and teacher-reported relational aggression were found to be related to each other, as shown in Table 3.

Table 3.

Pearson Correlations Between Teacher- and Parent-Report Measures of Relational and Physical Aggression

Aggression Measure	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. PSBS-PF Physical		.99**	.54**	.57**	.71**	.22	.51**	.14	.88**	.31
2. Log PSBS-PF Physical			.58**	.60**	.73**	.25	.49**	.22	.87**	.31
3. PSBS-TF Physical				.99**	.45	.72**	.46*	.09	.61**	.41*
4. Log PSBS-TF Physical					.47*	.70**	.58**	.19	.63**	.45*
5. CBCL Physical						.06	.23	-.05	.54**	.02
6. TRF Physical							.47*	.55**	.35	.74**
7. PSBS-PF Relational								.54**	.82**	.60**
8. PSBS-TF Relational									.41*	.96**
9. PSBS-PF Total										.49*
10. PSBS-TF Total										

* p < .05; ** p < .01

Hypothesis Testing

Hypothesis 1: Gender Differences in Aggression

Hypothesis 1 was that gender differences in aggression would be present, such that boys would be higher in physical aggression and girls would be higher in relational aggression. Descriptive statistics for aggression measures for the overall sample are presented in Table 4.

Table 4.

Descriptive Statistics for Aggression Measures For the Overall Sample

	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Min.</i>	<i>Max.</i>
Relational Aggression					
PSBS-PF	43	10.84	2.19	8	17
PSBS-TF	19	11.94	4.81	8	29
Physical Aggression					
PSBS-PF	43	8.77	2.27	7	17
Log PSBS-PF	43	.93	.10	.85	1.23
PSBS-TF	19	7.95	1.75	7	14
Log PSBS-TF	19	.89	.08	.85	1.15
CBCL	43	.53	.70	0	2
TRF	19	.10	.32	0	1
Overall Aggression					
PSBS-PF	43	22.98	4.30	18	38
PSBS-TF	19	23.21	6.13	18	45

T-tests were run to determine the presence of gender differences. Boys and girls were compared based on measures of physical aggression: PSBS-PF Physical Aggression, CBCL Physical Aggression, PSBS-TF Physical Aggression, TRF Physical Aggression. As shown in Table 5, there were no significant gender differences on any of the measures of physical aggression. Boys and girls were also compared on both measures of relational aggression: PSBS-PF Relational Aggression and PSBS-TF Relational Aggression. As shown in Table 6, no significant differences were found between boys and girls for either measure of relational aggression. As a follow-up, children were compared on measures of overall aggression and no significant gender differences were found, as shown in Table 7.

Table 5.

Gender Differences in Physical Aggression

	Boys ^a		Girls ^b		<i>t</i>	<i>df</i>	<i>p</i>	<i>Effect size (r)</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
PSBS-PF	9.16	2.75	8.22	1.22	1.35	41	.18	.21
Log PSBS-PF	.95	.11	.91	.06	1.21	41	.23	.19
PSBS-TF	8.45	2.11	7.25	0.71	1.54	17	.14	.36
Log PSBS-TF	.92	.09	.88	.04	1.64	17	.12	.28
CBCL	.61	.72	.45	.69	.74	41	.43	.21
TRF	.09	.30	.13	.35	-.23	17	.82	-.06

^a*N* = 25 for parent-report measures, *N* = 11 for teacher report measures^b*N* = 18 for parent-report measures, *N* = 8 for teacher report measures

Table 6.
Gender Differences in Relational Aggression

	Boys ^a		Girls ^b		<i>t</i>	<i>df</i>	<i>p</i>	<i>Effect size (r)</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Relational Aggression								
PSBS-PF	11.08	2.22	10.50	2.18	.85	41	.40	-.13
PSBS-TF	11.00	2.76	13.25	6.73	-1.01	17	.33	-.21

^a*N* = 25 for parent-report measures, *N* = 11 for teacher report measures

^b*N* = 18 for parent-report measures, *N* = 9 for teacher report measures

Table 7.

Gender Differences in Overall Aggression

	Boys ^a		Girls ^b		<i>t</i>	<i>df</i>	<i>p</i>	<i>Effect size (r)</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
PSBS-PF	23.88	5.00	21.72	2.78	1.66	41	.11	.25
PSBS-TF	22.64	3.59	24.00	8.77	-.47	17	.68	-.10

^a*N* =25 for parent-report measures, *N* =11 for teacher report measures

^b*N* =18 for parent-report measures, *N* =9 for teacher report measures

Hypothesis 2: Intent Attributions Associated with Aggression

Hypothesis 2 was that intent attributions in ambiguous situations would be associated with aggressive behaviour, such that a) tendency to assume hostile intent in physical situations would be linked to physical aggression, and b) tendency to assume hostile intent in relational situations would be linked to relational aggression. Hostile attribution data was available for 48 children. Descriptive statistics for hostile attributions are summarized in Table 8.

Table 8.

Descriptive Statistics for Hostile Attributions

Story Type	Statistic				
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Min.</i>	<i>Max.</i>
Relational	48	2.69	1.56	0	5
Physical	48	3.08	1.47	0	8

As shown in Table 9, Hypothesis 2a was partially confirmed, based on a one-tailed Pearson correlation. Specifically, tendency to assume hostile intent in physical situations was associated with physical aggression, as measured by the transformed (logged) PSBS-PF, $p = .05$. Hostile attributions were not associated with the other measures of physical aggression, however (TRF Physical Aggression, PSBS-TF Physical Aggression, and CBCL Physical Aggression). Furthermore, no significant correlations between hostile attributions for relational situations and relational aggression were found, as shown in Table 9. In addition, total hostile attributions for physical situations ($M = 3.04$, $SD = 1.25$; $Min. = 0$; $Max. = 5$) was highly correlated with total hostile attributions for relational situations ($M = 2.68$, $SD = 1.58$; $Min = 0$, $Max. = 5$), $r(48) = .81$; $p = .00$. A follow-up analysis revealed that the correlation between total hostile attributions and PSBS-PF Physical Aggression (logged) was not significant, $r(43) = .18$, $p = .12$. A simple regression analysis was run to examine whether PSBS-PF Physical Aggression (logged) could be predicted from hostile attributions to physical situations, and the result was not significant; $\beta = .25$; $t(42) = 1.65$, $F(1, 41) = 2.73$; $R^2 = .06$, $SE = .09$, $p = .11$. This means that even though physical aggression and hostile attributions for physical situations are linked, the link is not strong enough that physical aggression could actually be predicted from hostile attributions for physical situations.

Table 9.

Pearson Correlations Among Hostile Attributions and Aggressive Behaviours

	Story Type	
	Physical	Relational
Physical Aggression		
PSBS-PF	.23	.10
Log PSBS-PF	.25*	.10
PSBS-TF	.18	.21
Log PSBS-TF	.17	.21
CBCL	.21	.14
TRF	.36	.36
Relational Aggression		
PSBS-PF	.05	.35
PSBS-TF	.27	.21
Overall Aggression		
PSBS-PF	.16	.16
PSBS-TF	.29	.28

*p (one-tailed) $\leq .05$

Hypothesis 3: Links Between Response Decisions and Aggression

Hypothesis 3 was that proposed reactions to ambiguous situations would be associated with aggression, such that a) suggesting and choosing aggressive responses to physical situations would be associated with physical aggression, b) suggesting and choosing aggressive responses to relational situations would be associated with relational aggression. Children's responses to the situations could fall into 13 categories. The categories are described in detail in Appendix C.

To examine children's ability to come up with responses on their own, the number of children who were able to come up with responses to all 8 stories without being prompted with multiple choice options was counted. Results revealed that only 5 children (out of 48) came up with responses to all 8 stories on their own, without have to be prompted. Additionally, as shown in Tables 10 and 11, children commonly responded that they would involve an adult (such as a parent or teacher) and the number of children who actually reported that they would respond aggressively was fairly low.

Children who did choose to respond aggressively often had interesting responses. Examples of interesting physically aggressive responses include, "I would crush his head," "I would hit the kid and throw him in the mud," and "I would do it back." Examples of interesting relationally aggressive responses include, "I wouldn't let them play with me or talk to me and I wouldn't play with them either," "I would tell the kid to not invite him to the birthday party," and "I would say, 'I'm not going to play with you for 3 weeks and 20 years!'"

Table 10.

Responses to Physical Stories for Overall Sample (N = 48)

Response	Story				
	Shoes	Race	Colour.	Tag	Total
Physically Aggressive	2	2	4	2	10
Relationally Aggressive	1	1	0	1	3
Aggression of Another Type	0	0	1	0	1
Prosocial	2	4	4	5	15
Adult Involvement with No Punishment	17	18	17	16	68
Adult Involvement with Physical Punishment	0	0	0	0	0
Adult Involvement with Other Punishment	1	0	1	0	2
Withdrawal	1	2	2	0	4
Prompted Physical Aggression	2	0	2	1	5
Prompted Relational Aggression	0	4	2	2	10
Prompted Prosocial	3	3	1	0	7
Prompted "Do Nothing"	6	3	3	7	19
Other	13	11	2	10	36

Table 11.

Responses to Relational Stories for Overall Sample (N =48)

Response	Story				
	Stand.	Play.	Party	Puzzle	Total
Physically Aggressive	1	1	0	0	2
Relationally Aggressive	2	1	3	4	10
Aggression of Another Type	1	0	0	0	1
Prosocial	9	16	11	8	44
Adult Involvement with No Punishment	8	5	8	9	30
Adult Involvement with Physical Punishment	0	1	0	0	1
Adult Involvement with Other Punishment	0	0	0	0	0
Withdrawal	2	0	0	0	2
Prompted Physical Aggression	2	2	0	0	4
Prompted Relational Aggression	2	3	1	5	12
Prompted Prosocial	7	3	3	5	18
Prompted "Do Nothing"	2	5	5	2	14
Other	11	10	12	13	46

To find the total number of aggressive responses, responses that included relational aggression, physical aggression, another type of aggression other than relational or physical aggression, and adult involvement with mention of some type of punishment were all combined. The mean number of aggressive responses for physical stories was .60 ($SD = 1.06$, $Min. = 0$, $Max. = 4$) and for relational stories, the mean was .65 ($SD = 1.09$, $Min. = 0$, $Max. = 4$).

Aggressive responses to physical situations was associated with PSBS-PF Physical Aggression and even though this correlation was not significant, it can be considered a trend, $p = .06$ and this trend is present when the transformed (logged) version of the PSBS-PF is used. In addition, correlations between aggressive responses to physical situations and the other measures of physical aggression (CBCL, TRF, PSBS-TF Physical Aggression) were not significantly correlated. No significant links were found between aggressive responses to relational situations and either measure of relational aggression. These results are summarized in Table 12.

Table 12.

Correlations Among Aggressive Responses and Aggressive Behaviours

	Story Type	
	Physical	Relational
Physical Aggression		
PSBS-PF	.23	.42**
Log PSBS-PF	.24	.40**
PSBS-TF	.07	.01
Log PSBS-TF	.12	.13
CBCL	.19	.27*
TRF	-.24	.05
Relational Aggression		
PSBS-PF	-.01	-.01
PSBS-TF	-.09	.01
Overall Aggression		
PSBS-PF	.08	.23
PSBS-TF	-.09	-.02

* $p < .05$; ** $p < .01$

Interestingly, however, aggressive responses to relational situations was correlated with PSBS-PF Physical Aggression; $r(43) = .42, p = .01$ and this was also true when using the transformed (logged) PSBS-PF; $r(43) = .40, p = .01$.

The total number of aggressive responses across all situations was also examined; and was also significantly linked to PSBS-PF Physical Aggression; $r(43) = .36, p = .02$ and its log; $r(43) = .35, p = .02$.

A simple regression was run to examine whether PSBS-PF Physical Aggression could be predicted from total aggressive responses. Results revealed that an equation predicting PSBS-PF Physical Aggression (transformed) from aggressive responses across all situations was significant; $\beta = .35; t(42) = 2.37, F(1, 41) = 5.63; R^2 = .12, SE = .09, p = .02$. A follow-up analysis was run to examine whether age was correlated with PSBS-PF, and with aggressive responses, in case age was a third variable that might affect both of these variables. Results revealed that age was not significantly correlated with aggressive responses to relational situations $r(48) = -.20, p = .17$, aggressive responses to physical situations, $r(48) = -.23, p = .12$, or total aggressive responses, $r(48) = -.25, p = .09$. Age was also not significantly correlated with PSBS-PF Physical Aggression, $r(43) = -.05, p = .74$, or its log, $r(43) = -.07, p = .65$.

Hypothesis 4: Links Between Affective-Perspective Taking and Aggression

Hypothesis 4 was that affective-perspective taking skills would be a) negatively associated with physical aggression and b) positively associated with relational aggression. Affective-Perspective Taking data was available for 46 children. The mean score for the Emotion Identification part of the Affective-Perspective Taking task (APT

EI), which involved identifying emotions, but not explaining the reasons for the emotions, was 15.57 ($SD = 2.90$; $Min. = 8$, $Max. = 20$). The mean score for overall Affective-Perspective Taking (APT Total) was 21.17 ($SD = 5.68$; $Min. = 8$, $Max. = 28$).

Hypothesis 4a was not supported. Neither APT Total nor APT EI, was significantly correlated with any of the measures of physical aggression, as shown in Table 13.

Hypothesis 4b was partially supported, as shown in Table 13. APT Total was found to be positively associated with PSBS-TF Relational Aggression, $r(19) = .48$, p (one-tailed) = .02, as was APT EI, $r(19) = .42$, p (one-tailed) = .04, but neither APT Total nor APT EI were linked with PSBS-PF Relational Aggression.

A follow-up analysis was run to examine whether age was correlated with APT Total and PSBS-TF Relational Aggression, in case age was a third variable that might affect both of these variables. Results revealed that age was significantly positively correlated with APT Total, $r(46) = .59$, $p = .00$. In contrast, age was not significantly correlated with PSBS-TF Relational Aggression, $r(19) = .22$, $p = .19$. Therefore, a simple regression was run to examine whether PSBS-TF Relational Aggression could be predicted from APT Total. Results revealed that an equation predicting PSBS-TF from APT Total was significant; $\beta = .48$; $t(18) = 2.16$, $F(1, 16) = 4.66$; $R^2 = .23$, $SE = 4.47$, $p = .05$.

Table 13.

Correlations Among Affective-Perspective Taking and Aggressive Behaviours

Affective-Perspective Taking Measure		
	Emotion Identification	APT Total
Physical Aggression		
PSBS-PF	.19	.17
Log PSBS-PF	.18	.16
PSBS-TF	.12	.18
Log PSBS-TF	.08	.16
CBCL	-.06	-.03
TRF	.32	.35
Relational Aggression		
PSBS-PF	.19	.24
PSBS-TF	.42*	.48*
Overall Aggression		
PSBS-PF	.08	.23
PSBS-TF	.39	.46*

* p (one tailed) < .05

Hypothesis 5: Links Between Language Skill and Aggression

Hypothesis 5 was that language skill would be related to aggression, such that a) language skill would be negatively associated with physical aggression and b) language skill would be positively associated with relational aggression. Descriptive statistics for language skills are presented in Table 14. As shown in Table 15, Hypothesis 5a was partially supported. Pragmatic language as measured by the Descriptive Pragmatics Profile (DPP) was significantly negatively correlated with PSBS-TF Physical Aggression and its log. In addition, the Language Content Index (LCI) was negatively associated with TRF Physical Aggression. In contrast, the DPP and the LCI were not correlated with any other measures of aggression. In addition, none of the other language measures were associated with any of the measures of aggression and Hypothesis 5b was not supported.

Table 14.

Descriptive Statistics for Language Measures Using the CELF Preschool II

	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Min.</i>	<i>Max.</i>
Core Language Scale	40	106.40	12.84	63	125
Receptive Language	37	109.41	10.67	81	127
Expressive Language	37	106.05	12.07	75	134
Language Content	37	108.11	13.22	63	128
Language Structure	37	105.16	14.90	65	133
Descriptive Pragmatics	37	90.19	10.35	61	104
Preliteracy Rating	37	79.92	18.43	40	104

Table 15.

Correlations Between Aggression and Language (Core Language Score, Expressive Language Index, Receptive Language Index, Language Content Index, Language Structure Index, Pre-literacy Rating Scale, and Descriptive Pragmatics Profile

Aggression Measure	CLI	ELI	RLI	LCI	LSI	PLRS	DPP
PSBS-PF Physical	.18	-.01	.16	-.04	.19	.01	-.13
Log PSBS-PF Physical	.16	-.02	.17	-.04	.18	-.04	-.19
PSBS-TF Physical	-.03	-.09	-.24	-.27	.09	-.14	-.42*
Log PSBS-TF Physical	.04	-.09	-.26	-.26	.07	-.14	-.41*
CBCCL Physical	-.13	-.17	.06	-.17	-.11	.04	-.15
TRF Physical	-.19	-.18	-.36	-.40	.02	-.02	-.29
PSBS-PF Relational	.00	-.10	-.02	-.15	.10	.01	.09
PSBS-TF Relational	-.29	-.18	-.32	-.27	-.06	.17	.08
PSBS-PF Total	.12	-.05	.08	-.09	.15	.03	-.03
PSBS-TF Total	-.27	-.18	-.36	-.33	-.03	.08	-.05

* p (one-tailed) < .05

Follow-Up Analyses

Links Among Age, Affective-Perspective Taking, and Hostile Attributions for Ambiguous Situations

As mentioned, hostile attributions for physical situations were correlated with parent-reported physical aggression, but did not significantly predict physical aggression. In addition, hostile attributions for the two different types of situations (physical and relational) were highly correlated. A follow-up analysis was conducted to examine what might contribute to the development of hostile attributions overall. Since hostile attributions have been correlated with aggression among older children in a number of studies (e.g., see Orobio de Castro, 2001, for a review), it was inferred that tendency to make hostile attributions might become increasingly important with age.

Results revealed that age was positively correlated with total hostile attributions, $r = .31, p = .04$, meaning that as children get older, they have a greater tendency to interpret ambiguous situations as aggressive. Since age was already found to be positively correlated with APT Total, it was posited that affective-perspective taking might mediate the relationship between age and hostile attributions.

To test this mediation model, simple regression analyses were necessary. Results revealed that age was a significant predictor of hostile attributions; $\beta = .31; t(46) = 2.17, F(1, 46) = 4.73; R^2 = .09, SE = 2.75, p = .04$. Results also revealed that age was a significant predictor of APT Total; $\beta = .59; t(46) = 4.90, F(1, 46) = 24.04; R^2 = .35, SE = 4.62, p = .00$. Since age was positively linked to affective-perspective taking, and age was also linked to hostile attributions ambiguous situations, the next step was to test

whether affective-perspective taking was linked to hostile attributions. Results revealed that affective-perspective taking was indeed a significant predictor of hostile attributions for ambiguous situations; $\beta = .51$; $t(44) = 3.89$, $F(1, 43) = 15.05$; $R^2 = .26$, $SE = 2.53$, $p = .00$. In order for this to be considered a true mediation, affective-perspective taking would need to be linked to hostile attributions, while controlling for the effect of age. The Sobel bootstrapping technique, as described in Preacher and Hayes (2004) was used to investigate this mediation model. The link between age and hostile attributions was confirmed as significant; Sobel coefficient = .09; $SE = .04$; $t = 2.55$; $p = .02$. The link between APT Total and hostile attributions was also confirmed as significant; Sobel coefficient = .30; $SE = .06$; $t = 5.03$, $p = .00$. It was also discovered that the link between affective-perspective taking and hostile attributions was significant when controlling for age; Sobel coefficient = .23, $SE = .08$; $t = 2.75$, $p = .01$. In addition, the link between age and hostile attributions was not significant when controlling for affective-perspective taking; Sobel coefficient = .02; $SE = .04$; $t = .49$; $p = .62$. These results show that the data fit the criteria for a true mediation (Preacher and Hayes, 2004). In other words, age leads to more hostile attributions and the mechanism through which this happens is that affective-perspective taking increases as children get older and this results in more hostile attributions. This mediation model is presented in Figure 1.

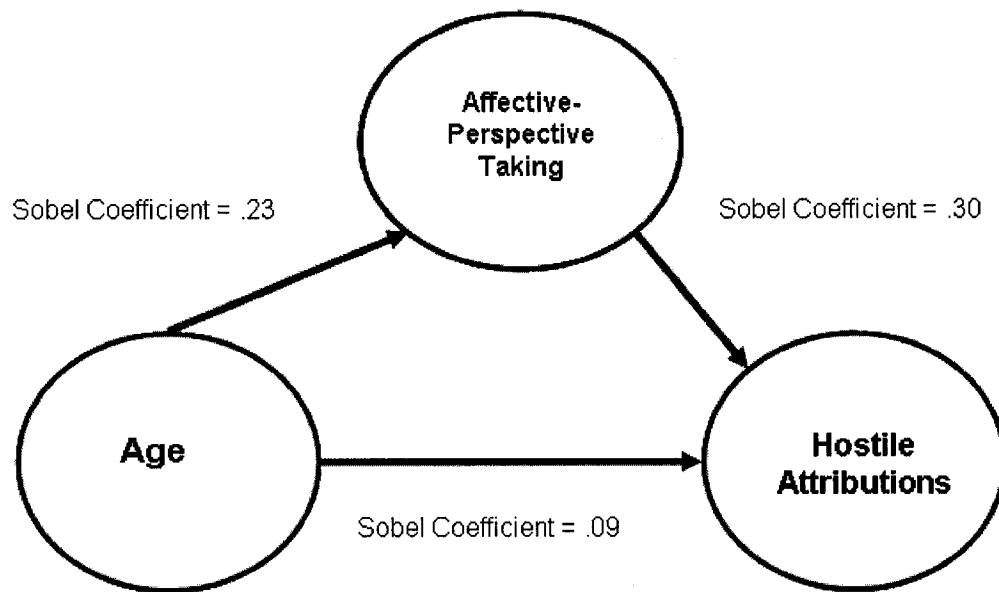


Figure 1. Affective-perspective taking mediates the link between age and hostile attributions as confirmed by Sobel bootstrapping tests.

Links Between Type of Aggressive Response and Type of Situation

Analyses were conducted to examine whether there were differences between the types of aggressive responses that children gave to the two types of ambiguous situations. There were more physically aggressive responses to physical situations ($M = .31$, $SD = .78$), than relational situations ($M = .15$, $SD = .41$); however, a dependent t-test revealed that this difference was not significant, $t(47) = -1.53$, $p = .13$. The analysis was then conducted separately for boys and girls. For boys ($N = 27$), there were more physically aggressive responses to physical situations ($M = .33$, $SD = .83$) than relational situations ($M = .15$, $SD = .46$), but this difference was not significant, $t(26) = -1.31$, $p = .20$. The result was similar for girls ($N = 21$). There were more physically aggressive responses to physical situations ($M = .29$, $SD = .72$) than relational situations ($M = .14$, $SD = .36$), but the difference was not significant, $t(20) = -.83$, $p = .42$.

A dependent-sample t-test revealed that although children gave more relationally aggressive responses to relational situations ($M = .44$, $SD = .82$), than physical situations ($M = .23$, $SD = .47$), this difference was not significant for the overall sample, $t(47) = -1.74$, $p = .09$. This analysis was also done separately for boys and girls. For boys, there were actually more relationally aggressive responses to physical situations ($M = .30$, $SD = .54$) than relational situations ($M = .22$, $SD = .52$), but this difference was not significant; $t(26) = .63$, $p = .54$. For girls, there were more relationally aggressive responses to relational situations ($M = .71$, $SD = 1.10$) than physical situations ($M = .14$, $SD = .36$), and this difference was significant, $t(20) = -2.8$, $p = .01$. This means that girls are more likely to respond to situations that involve potential relational aggression (as opposed to

those that involve physical aggression) with some relational aggression of their own, whereas boys' responses do not seem to be related to the type of situation.

The Effect of Age on Physically and Relationally Aggressive Responses

Even though age was not significantly linked to overall aggressive responses, a follow-up analysis was conducted to examine whether age was linked with the different types of aggressive responses. Results revealed that age was significantly linked with physically aggressive responses to all situations ($M = .49$, $SD = 1.00$), $r(48) = -.30$, $p = .04$. A follow-up analysis revealed that this correlation was significant for boys ($M = .48$, $SD = 1.12$), $r(48) = -.38$, $p = .05$, but not girls ($M = .43$, $SD = .81$), $r(48) = -.14$, $p = .55$. That is, boys' likelihood of responding to an ambiguous situation with physical aggression decreases with age, but this is not true for girls. Additionally, no significant links were found between age and relationally aggressive responses for the overall sample, girls, or boys.

Links Between Adult Involvement and Aggression

Involving an adult in an ambiguous situation that involves some type of harm caused by another child could be considered relational aggression in some circumstances since it is often motivated by a desire to hurt someone by getting the peer in trouble with an authority figure (known in some circles as "tattle-taling") and often results in a child being excluded from a group (e.g., "timeout"). Nevertheless, a large portion of children reported that they would tell a teacher or a parent without any mention of hoping to get another child in trouble. As Peter Ralston of the Crick Social Development Lab pointed out (personal communication, 2008), assuming that they were being relationally

aggressive could be considered a hostile attribution on our part. To determine whether this seemingly innocent adult-involvement behaviour (i.e., responses that simply included mention of telling an adult without mentioning any desired punishment for the peer) was related to relational aggression, a Pearson correlation was calculated. Results revealed a highly significant relationship between adult involvement responses ($M = 2.04$, $SD = 2.42$; Min. = 0, Max. = 8) and both parent-reported relational aggression, $r(43) = .39$, $p = .01$, and teacher-reported relational aggression, $r(19) = .56$, $p = .01$. A simple regression analysis revealed that PSBS-PF Relational Aggression can be predicted from adult involvement responses, $\beta = .39$; $t(41) = 2.69$, $F(1, 42) = 7.23$; $R^2 = .15$, $SE = 2.05$, $p = .01$. In addition, a simple regression analysis revealed that PSBS-TF Relational Aggression can be predicted from adult involvement responses, $\beta = .56$; $t(17) = 2.81$, $F(1, 17) = 7.87$; $R^2 = .32$, $SE = 4.09$, $p = .01$.

Since adult involvement was correlated so highly with relational aggression, follow-up analyses were run to examine what might lead to this adult involvement behaviour. It was inferred that if adult involvement is related to relationally aggressive behaviour, it would probably be linked to wanting to get a child in trouble (even if the children did not specifically say that is why they would tell adults). In order to get a peer in trouble, the child would be expected to believe that the child had done something wrong or "mean." For this reason, it was inferred that hostile attributions would predict adult involvement behaviour. A simple regression revealed that this was in fact the case; hostile attributions significantly predicted adult involvement, $\beta = .43$; $t(46) = 3.20$, $F(1, 46) = 10.21$; $R^2 = .18$, $SE = 2.22$, $p = .00$. Since affective-perspective taking mediated the link between age and hostile attributions, and since affective-perspective taking was linked to teacher-

reported aggression, it was posited that affective-perspective taking might also mediate the link between hostile attributions and adult involvement responses. A simple regression analysis revealed that hostile attributions do predict affective-perspective taking, $\beta = .51$; $t(43) = 3.88$, $F(1, 43) = 15.05$; $R^2 = .26$, $SE = 4.98$, $p = .00$. In order for this to be considered a true mediation, affective-perspective taking would need to be linked to adult involvement, while controlling for the effect of hostile attributions. The Sobel bootstrapping technique, as described in Preacher and Hayes (2004) was used to investigate this mediation model. The link between hostile attributions and adult involvement was confirmed as significant; *Sobel coefficient* = .09; $SE = .04$; $t(46) = 2.55$; $p = .02$. The link between hostile attributions and affective-perspective taking was also confirmed as significant; *Sobel coefficient* = .30; $SE = .06$; $t(43) = 5.03$, $p = .00$. The link between affective-perspective taking and adult involvement was significant when controlling for hostile attributions; *Sobel coefficient* = .23, $SE = .08$; $t(43) = 2.75$, $p = .01$. In addition, the link between hostile attributions and adult involvement was not significant when controlling for affective-perspective taking; *Sobel coefficient* = .02; $SE = .04$; $t(43) = .49$; $p = .62$. These results show that these data also fit the criteria for a true mediation (Preacher and Hayes, 2004). Therefore, hostile attributions predict more adult involvement (which is highly related to relational aggression) and this link is moderated by affective-perspective taking. These results, combined with the finding that the link between age and hostile attributions is mediated by affective-perspective taking, and the finding that affective perspective taking is linked with relational aggression are displayed in Figure 2.

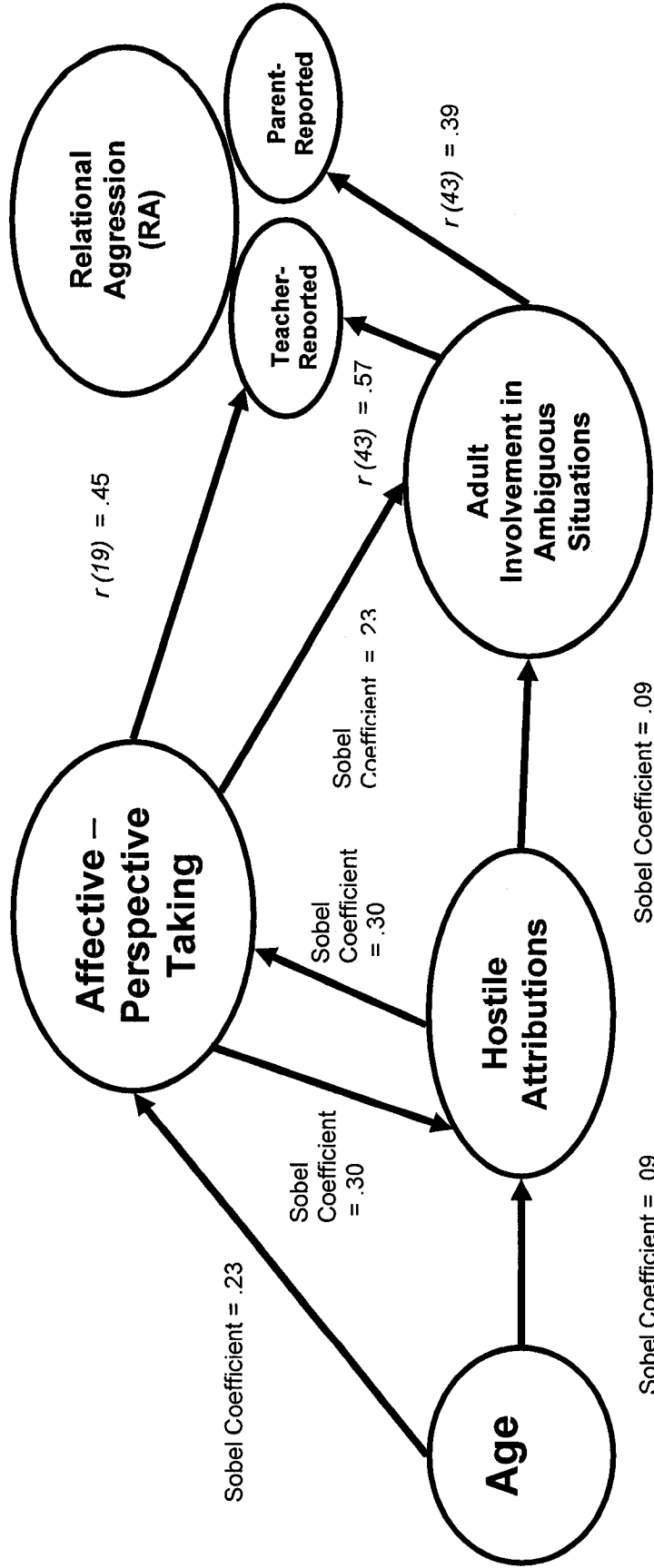


Figure 2. The Mediating role of affective-perspective taking in the links between age, hostile attributions, adult involvement, and relational aggression

Links Between Socio-Economic Status (SES) and Aggression

Parental Education. Since the mothers in the current study were well-educated and since there was little variability in their education, no analyses were done to examine the effect of their education on their children's behaviour.

Paternal education was more variable, however. Twenty-nine children had fathers who had graduated from college or university and 16 had fathers who had not done so. The aggression of the children of these fathers was compared using independent samples *t*-tests and no significant differences were found, as shown in Tables 16, 17, and 18.

Table 16.

Comparison of Physical Aggression of Children Whose Fathers Did and Did Not Graduate From College or University

	Father Graduated			Father Did not Graduate			<i>t</i>	<i>df</i>	<i>p</i>	Effect size (<i>r</i>)
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>				
PSBS-PF	29	8.55	2.08	14	9.21	2.64	-.90	41	.37	-.14
Log PSBS-PF	29	.92	.08	14	.95	.11	-.89	41	.38	-.15
PSBS-TF	13	7.85	1.95	6	8.17	1.33	-.36	17	.72	-.10
Log PSBS-TF	13	.88	.08	6	.91	.07	-.80	17	.44	-.20
CBCL	27	.48	.64	16	.63	.81	-.64	41	.52	-.10
TRF	13	.08	.28	6	.17	.41	-.57	18	.58	-.13

Table 17.

Comparison of Relational Aggression of Children Whose Fathers Did and Did Not Graduate From College or University

	Father Graduated		Father Did Not Graduate		<i>t</i>	<i>df</i>	<i>p</i>	Effect size (<i>r</i>)
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>		
PSBS-PF	29	10.62	1.72	13	11.29	2.97	.93	.36
PSBS-TF	13	10.23	1.64	7	15.67	7.26	-1.81 ^a	.13 ^a
							5.24 ^a	-.19

^a Because Levene's test for equality of variances was significant, $p = .04$, the t-test for equality of variances not assumed was used.

Table 18.

Comparison of Overall Aggression of Children Whose Fathers Did and Did Not Graduate From College or University

	Father Graduated		Father Did Not Graduate		<i>t</i>	<i>df</i>	<i>p</i>	Effect size (<i>r</i>)
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>		
PSBS-PF	29	22.66	4.08	14	23.62	4.81	.70	.49
							14	-.11
PSBS-TF	12	21.23	2.49	7	27.50	9.38	-1.61 ^a	.16 ^a
							5.33 ^a	-.41

^aBecause Levene's test for equality of variances was significant, $p = .03$, the *t*-test for equality of variances not assumed was used.

Maternal Occupations. As mentioned in the Participants section, a large portion of the sample had mothers who were teachers or who worked in healthcare. Since these professions are sometimes called “helping professions” and might be expected to be associated with a knowledge of healthy development, the differences in aggression between those whose mothers worked in education or healthcare and those whose mothers worked some other type of job were compared. As shown in Table 19, no significant differences were found. Since teacher-reported aggression data was only available for 3 children whose mothers did not work in helping professions, comparisons were only made based on parent-reported measures of aggression. Because there was little variety in paternal occupations in the current sample, no comparisons were made based on paternal education.

Table 19.

Comparison of Aggression of Children Whose Mothers Work in 'Helping Professions' and Children Whose Mothers Work in Other Professions

	Mother Works in Helping Profession			Mother Does Not			<i>t</i>	<i>df</i>	<i>p</i>	Effect size (<i>r</i>)
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>				
PSBS-PF Physical	26	8.85	2.62	16	8.63	1.71	.30	40	.77	.05
Log PSBS-PF Physical	26	.83	.11	16	.93	.08	.14	40	.89	.10
CBCL Physical	26	.50	.58	16	.62	.89	-.50 ^a	23.10 ^a	.62 ^a	-.08
PSBS-PF Relational	26	11.31	2.40	16	10.19	1.68	1.64	40	.11	.26
PSBS-PF Overall	26	23.65	5.07	16	22.00	2.63	1.21	40	.24	.20

^aBecause Levene's test for equality of variances was significant, $p = .01$, the t-test for equality of variances not assumed was used

Income. To examine the effect of income on aggression, Kruskal-Wallis tests were conducted. The choice to use this non-parametric test was made because income was measured in the form of ordinal data, rather than interval data, and interval data is required for parametric tests. Results revealed no significant effects of income on aggression; CBCL Physical Aggression $\chi^2(5) = 6.45, p = .27$, PSBS-PF Physical Aggression $\chi^2(5) = 9.95, p = .07$, PSBS-PF Log Physical Aggression $\chi^2(5) = 9.95, p = .07$, PSBS-TF Physical Aggression $\chi^2(4) = 5.73, p = .22$, PSBS-TF Log Physical Aggression $\chi^2(4) = 5.73, p = .22$, TRF Physical Aggression $\chi^2(4) = 1.06, p = .91$, PSBS-PF Relational Aggression $\chi^2(5) = 4.62, p = .46$, PSBS-TF Relational Aggression $\chi^2(4) = .51, p = .97$, PSBS-PF Total Aggression $\chi^2(5) = 9.37, p = .09$, and PSBS-TF Total Aggression $\chi^2(4) = 1.74, p = .78$.

CHAPTER 4

DISCUSSION

The purpose of this thesis was to replicate and expand on research on physical and relational aggression among preschool children. This study is the first to use a parent-report measure of relational aggression in preschool children. In addition, this study is among the first to examine links between social-information processing and both physical and relational aggression in a preschool sample. Furthermore, it is among the first to explore links between affective-perspective taking and physical and relational aggression in a preschool sample and may be the very first to find a link between affective-perspective taking and hostile attributions among preschoolers, as well as a link between suggesting adult involvement in response to an ambiguous situation and relational aggression. Furthermore, this is the first known study to find a link between pragmatic language and physical aggression among preschoolers. Information on aggressive behaviour in preschoolers is important for the development of the field because little research has been done in this area and early intervention is critical. Increasing the understanding of the development of aggressive behaviour among young children is crucial for clinical psychologists and other professionals who seek to intervene early to help children succeed socially.

Gender Differences in Aggressive Behaviour

Contrary to what was expected, no significant gender differences were found for any of the measures of aggression. This is inconsistent with previous research (e.g., Bonica et al., 2003; Burr et al., 2005; Côté et al., 2006; Crick et al., 1997; Crick et al., 1999; Crick

et al., 2006; Dunn & Hughes, 2001; McEvoy, Estrem, Rodriquez, & Olson, 2003; Ostrov & Keating, 2004; Schultz et al., 2000; Strayer, & Roberts, 2004; Tomada & Schneider, 1997; Vaughn et al., 2003; Werner et al., 2006). Some other researchers have failed to find gender differences in aggression in preschool children (e.g., Hart et al., 1998; Perrson 2005a; 2005b), but these failures to find differences have tended to be explained by cultural differences or small sample sizes.

There are a number of reasons why gender differences that are actually present in the general population may not have been revealed by the current sample. The sample was not completely generalizable to the general population because all of the children lived with both parents (none had experienced divorce), most of the children were White, and the parents in this sample were quite well-educated, and had fairly high salaries. The absence of gender differences was likely related to the low levels of aggression of the children in the current sample. Since the children were not very aggressive overall, it was less likely that gender differences would be found.

In addition, the CBCL and TRF Physical Aggression scales that were created and used in the current study were only made up of 3 items each. This small number of items further limited the amount of possible variability in aggression; which decreased the likelihood of finding gender differences. It is important to note that this analysis brought to light the very few items that actually measure physical aggression on the CBCL and TRF checklists. Even though these scales were created empirically (Achenbach & Rescorla, 2000; 2001), future researchers may seek to increase the construct validity of the Aggression scale by including more items that actually measure physical aggression.

This was the first known study to have parents complete the PSBS. There is a chance that parents responded socially desirably, which would unrealistically limit the amount of variability in aggression. Nevertheless, measures of parent-reported aggression were actually correlated with measures of teacher-reported aggression, thus, there is some suggestion that parents responded accurately since teachers would be less likely to want to present their students as well-behaved. This increases confidence in the concurrent validity of the PSBS-PF.

Additionally, only 20 teachers provided information on children's aggressive behaviour. This limited the sample size that could be used to examine differences in teacher-reported aggression and thus decreased the power of the analysis. Even the number of children whose parents provided information about their aggressive behaviour was fairly low ($N = 43$). Including more people would have increased the power and the likelihood of finding a more variable and generalizable sample.

It is also possible, however, that the gender differences in aggression observed in the current study actually reflect a lack of gender differences in the actual population. It is possible that gender differences in aggression are decreasing with time, just as gender differences in other areas have decreased over the years, such as personality traits (e.g., Twenge, 1997) and math skills (e.g., Friedman, 1989).

It is also possible that Canadian children in Windsor are more androgynous than children elsewhere (especially in the United States where most of the studies on gender differences in aggression have taken place). Some incidental observational evidence supports this. Children in the current study were presented with a variety of toys and were given an opportunity to play with the toys of their choice. It was observed that many of

the boys chose to play with stereotypically feminine toys, such as a bright pink play house and toy fairies. Furthermore, many of the girls played with traditional masculine toys, such as a firetruck and dinosaurs. Additionally, many boys chose traditionally feminine stickers including prominent female characters and girls chose a number of more traditionally masculine stickers depicting male characters. Further evidence for androgyny among the children comes from the fact that there were no significant gender differences between physically aggressive responses and relationally aggressive responses to ambiguous situations.

Additionally, the current sample is quite young, even for a preschool sample. Young children may not have internalized gender schemas yet and this may explain why boys and girls do not behave differently from each other in this particular area. It is possible that these children's aggressive behaviour will become more gender-schematic with age as their understanding of gender-typed behaviour becomes greater cognitively and as they learn the social rewards that result from engaging in gender-typed behaviour.

The lack of gender differences in aggression in the current study is also consistent with the Gender Similarities Hypothesis (Hyde, 2005); which refers to the fact that boys and girls and men and women are similar on most psychological traits and that gender differences are often exaggerated in the research and in the general population. Hyde (2005) examined six studies that reported effect sizes for gender differences in aggression across a variety of age groups and found that most of the effect sizes were quite low.

Intent Attributions and Aggressive Behaviour

Hypothesis 2 was partially supported as hostile attributions for physical situations were associated with physically aggressive behaviour based on the PSBS-PF Physical Aggression. This means that children who make hostile attributions in physical situations are more likely to engage in physical aggression themselves, which is consistent with the idea that deviant processing at Step 2 of the Social-information processing model (interpretation of cues) results in aggressive behaviour (Crick & Dodge, 1996). This suggests that some children may behave more physically aggressively than their peers at least partly because they tend to 'assume the worst' in others, thinking that if harm is caused to them by someone else, it must have been done on purpose. This likely results in physical retaliation.

Contrary to Hypothesis 2b, however, no significant links were found between hostile attributions for relational situations and relationally aggressive behaviour. The lack of finding of a link between hostile attributions for relational situations and relational aggression may have been because the choice between hostile and non-hostile simply required pointing to a puppet. It is possible that some children simply pointed to a puppet without really thinking about their decisions. Having children respond orally by saying, "I think that is mean" or "I don't think that is mean," would have decreased the chances of this arbitrary responding, but it would also increase the chances that a child would simply say, "I don't know."

Very little research has examined links between intent attributions and aggressive behaviour among this age group, but these results are consistent with the findings of other researchers, such as Katsurada, and Sugawara (1998) who did find significant links between hostile attributions and aggressive behaviour. The results may be explained by a

phenomenon described by Dodge (2006). He argues that most young children are unable to separate the intention of another person from their own experience; thus, if a young child gets hit with a crayon, he is unable to separate his own experience of pain from the idea that the person who threw the crayon might not have meant to cause injury. Dodge (2006) argues that the ability to separate one's own experience from the intention of another person develops around school age for many children. Perhaps the link between physical aggression and hostile attributions for physical situations was stronger than the link between relational aggression and hostile attributions for relational situations because the physical injury that would result in the physical situations was more obvious and easier to imagine than the relational aggression which may be more difficult for young children to picture since it is less visible. Imagining physical injury may have made it more difficult for these young children to separate the idea that they would be hurt from the idea that someone may or may not have intended to cause harm. A follow-up study would be especially valuable to attempt to pinpoint the stage at which potential relational aggression becomes important for some children to the point that a significant link can be found between hostile attributions for relational situations and relational aggression.

Aggressive Responses and Aggressive Behaviour

Results revealed that very few children were able to come up with responses to the situations on their own. Specifically, only 5 children were able to say an action that they would do if the situation happened to them for all 8 stories. This suggests that children of this age have a lot of difficulty with Step 4 of the social-information processing model (Response Action or Construction). Providing children with options of responses and

having them choose allowed them to skip Step 4 of the social-information processing model and instead go directly to Step 5 (Response Decision). This task was much easier for the children and they were all able to come up with a response if given options. This shows the critical importance of helping children to internalize a set of options for responding to negative situations and the confidence to generate new ones. Intervention programs that help children to come up with a set of options for dealing with problems and choosing one of those options would be expected to be beneficial to a young child's social development. Some children may not respond appropriately to a situation simply because they do not know what their options are.

Contrary to Hypothesis 3, no significant links were found between aggressive responses to physical stories and physical aggression or between aggressive responses to relational stories and relational aggression. This may have been because of the small number of aggressive responses to the situations, coupled with the low values of aggression in the sample. In addition, the low levels of aggressive responses may be related to the fact that young children may have difficulty imagining themselves in a particular situation and thus may be less likely to say what they would really do if they were actually in that situation.

Nevertheless, a significant correlation was found between aggressive responses to both types of situations combined and parent-reported physical aggression. This study is among the first to find this link among preschool children and is consistent with the very little previous research that exists on this topic using a preschool sample (e.g., Mize and Ladd, 1988) and with Steps 4 and 5 of Crick & Dodge's (1996) social-information processing model.

A follow-up analysis revealed no significant link between hostile attributions to physical situations and aggressive responses (even though these were both linked with PSBS-PF Physical Aggression). This finding is important because it suggests that some young children who are higher in aggression may bypass Step 2 (Interpretation of Cues) of the Social Information Processing Model (Crick & Dodge, 1996) and may simply jump to Steps 4 and 5 (Response Access or Construction and Response Decision). As Dodge (2006) suggested, these children may focus on how they would feel if this happened to them without being able to have the cognitive flexibility to be able to simultaneously appreciate that something negative could happen to them for another reason other than a persons' intention to harm them. As children get older and can be taught to become more cognitively flexible and understand how one negative outcome could result from a variety of causes (including intentional and accidental behaviour).

In addition, the finding of a link between aggressive responses and parent-reported aggression is interesting because it suggests that children are somewhat aware of their own aggressive behaviour. Listening to an ambiguous story and responding that one would do something aggressive if the situation occurred is like admitting to being aggressive. This is important to know because it suggests that some young children who are higher in aggression than others may be willing to discuss what they would do in social situations and may be open to talking about how they tend to choose aggressive responses. If an appropriate intervention could be designed, this willingness could be used to help children learn about alternative ways to respond to harm caused by someone else.

Affective-Perspective Taking and Aggressive Behaviour

Contrary to what was expected, Hypothesis 4a was not confirmed; affective-perspective taking was not significantly linked with physically aggressive behaviour. This was inconsistent with previous research (e.g., Denham et al., 2002; Garner et al., 2007). This was likely due to the low degree of physically aggressive behaviour in the sample, which results in less variability and less chance of finding a link. In addition, Denham et al. (2002) observed how affective-perspective taking at age 3 predicted aggression at age 5. It would be interesting to do a longitudinal study with the current sample to examine whether their affective-perspective taking now would predict their aggressive behaviour in one or two years. In addition, Garner et al. (2007) used slightly more difficult measures of affective-perspective taking because it involved the use of 5 emotions, instead of 4. Perhaps, increasing the difficulty of the tasks by adding more emotions would result in more variability and perhaps would increase the chances of detecting a significant link with physical aggression.

It is also possible that affective-perspective taking and physically aggressive behaviour are not linked in the population. It could be that children avoid engaging in physical aggression because they fear getting in trouble, rather than because they understand another person's emotions. Support for this idea comes from the fact that a substantial portion of children tended to respond to ambiguous situations involving potential physical aggression by saying that they would tell the teacher. Therefore, it follows that children might know that if they are physically aggressive, an adult will find out and they will get in trouble. At a young age, that may be more of a deterrent than avoiding hurting someone's feelings.

Hypothesis 4b, that affective-perspective taking would be associated with relational aggression, was partially supported. The link was significant for teacher-reported relational aggression, but not parent-reported relational aggression. This is likely because teachers have more of an opportunity to see children interacting with a variety of children (including children that they do not like), whereas, parents tend to have less of an opportunity to view their children in social interactions. This is the first known study to find this link between affective-perspective taking and relational aggression. The finding suggests that children who are better able to understand the emotions of others are more likely to use relationally aggressive strategies. This makes sense because it is important to understand which relationships are important to someone in order to successfully control or manipulate them. Clinical applications could be designed to help children to use their emotional understanding in more positive ways to resolve conflicts, instead of using their skills to harm other children. It is also likely that the link is reciprocal. Children who engage in more relational aggression may begin to develop a better emotional understanding because in their attempts to manipulate or control others, they have a chance to see what works and what does not and this results in a better understanding of how others think and feel.

Language and Aggressive Behaviour

A link was found between teacher-reported physical aggression based on three items from the TRF and with the Language Content Index, based on the CELF Preschool, Second Edition. This link must be interpreted cautiously since the TRF Physical Aggression score was only based on three items that only ranged from 0 to 1, but it is

consistent with previous research (e.g., Werner et al., 2006). Language content may be more important than language structure in predicting aggression since language content refers to understanding the actual meaning of the words and sentences, whereas language structure refers to their proper use. No significant links were found between any other measures of language based on child performance and any measures of aggression. This is inconsistent with some research (e.g., Werner et al., 2006; Estrem, 2005; Bonica et al., 2003), but other studies have failed to find a link between aggression and language (e.g., Carson, Klee, Perry, Muskina, Donaghy et al., 1998). In addition, a review of the literature suggests that the link between language and aggression is fairly moderate among young children (Dionne, 2005). Also, very few children in the current study actually had language impairments. Nevertheless, parent-reported pragmatic language based on the Descriptive Pragmatics Profile (DPP) of the CELF Preschool-II was negatively linked with teacher-reported physical aggression (PSBS-TF Physical Aggression). This is consistent with previous findings of a link between physical aggression and pragmatic language difficulties in older children (Dionne, 2005), but this is believed to be the first study to find a link between pragmatic language and teacher-reported physical aggression in preschool children.

Affective-Perspective Taking Mediates the Link Between Age and Hostile Attributions

A follow-up analysis was done to examine the development of hostile attributions. Affective-perspective taking was found to be a mediator of the relationship between age and hostile attributions. As children get older, they make more hostile attributions and the

mechanism by which this happens is that children develop better affective-perspective taking skills with age. This study is the first to find this mediation model.

The reason why hostile attributions increase with age is probably due to the fact that children become better at imagining how they would feel in that particular situation. Imagining how one would feel tends to result in a hostile attribution for a young child because preschool-age children tend not to be able to clearly separate their own experience from the intention of another person (Dodge, 2006). Since young children are more egocentric and less cognitively flexible, they tend to focus on the fact that they are hurt, not on the fact that someone else might have accidentally hurt them and may have had a variety of non-hostile intentions.

Clinical applications of this finding might involve helping children to use their increasing affective-perspective taking skills to imagine themselves in more than one situation. For example, children could be taught to imagine how they would feel in an ambiguous situation and then immediately afterward, they could be asked to imagine that they were the “perpetrator” in the ambiguous situation and that they accidentally harmed someone else. Learning to use their affective-perspective taking skills in this way might result in decreased hostile attributions.

If a longitudinal study was conducted, it would be expected that at one age (around age 7 years), the link between hostile attributions and age would no longer be significant and it might even reverse; whereas affective-perspective taking would be expected to continue to increase with age. This is because children are expected to eventually be able to use their affective-perspective taking skills to avoid making hostile attributions and because children are expected to develop more cognitive flexibility with age so they are

more likely to understand that one outcome could result from a variety of intentions and causes.

Gender Differences in the Influence of Situation Type on Aggressive Responses

Analyses were conducted to see whether the type of situation (physical or relational) would influence the type of aggressive response (physical or relational). Results revealed that boys did not seem to be as affected by the response type, compared to girls. Boys were not significantly more likely to give one type of aggressive response over another to a certain type of situation. In contrast, girls were significantly more likely to give relationally aggressive responses to relational situations, compared to physical situations. This result suggests that girls are more likely to use relational aggression in response to possible relational aggression, rather than in response to possible physical aggression. This may mean that girls have a preference for using relational aggression to retaliate against relational aggression. This may be related to a developing understanding of the gendered nature of aggressive behaviour, which has previously been explored by Giles & Heyman (2005) who found that many boys and girls are already aware at preschool age that girls tend to be mean by using relational aggression, and boys tend to be mean by using more overt aggression.

The Effect of Age on Boys' Physically Aggressive Responses

Results revealed that boys were significantly less likely to make physically aggressive responses to ambiguous situations as they got older. In contrast, girls' physically aggressive responses were not significantly affected by age. In addition, age did not seem

to have a significant effect on relationally aggressive responses. Boys may be more likely to use less physically aggressive responses as they get older because of the increased understanding that physically aggressive responses usually result in punishment that would be expected to develop based on first-hand experience and by social learning. It could be that girls are less likely to decrease in physically aggressive responses because they may not be exposed to the consequences of physical aggression to the same degree as boys with age. It could be that girls may be exposed to fewer examples of physical aggression (and therefore view fewer consequences) in the media and they may engage in less rough-and-tumble play (e.g., Colwell & Lindsay, 2005).

Seeking Adult Involvement in Ambiguous Situations

Results revealed that a substantial portion of children reported that they would tell an adult (such as a parent or teacher) if they were in one of the ambiguous situations presented. Interestingly, this tendency to tell an adult (or what some might consider “tattletaling”) was highly associated with both parent- and teacher-reported relational aggression. This suggests that adult involvement may actually be a form of relational aggression in some cases. Children who tell the teacher may anticipate a “time-out” or at least feelings of embarrassment for the target. It is also possible, however, that children who ask adults for help are simply higher in the tendency to want to manipulate peer relationships because of some other variable, such as a desire for control. Furthermore, hostile attributions were found to significantly predict adult involvement, and this relationship was mediated by affective-perspective taking. This means that children who have a tendency to perceive others as being mean, even when they may not be mean, also

tend to seek assistance from adults or seek punishment for their peers. Having a well-developed emotional understanding might moderate this link because a child who has better affective-perspective taking skills would be more likely to know that telling an adult is likely to result in punishment for the peer and either reward or neutral reaction from the authority figure toward the self. A model showing the important role that affective-perspective taking plays in the links among age, hostile attributions, and adult involvement is illustrated in Figure 2.

Socio-Economic Status and Aggression

To explore the effect of paternal education on aggression, children whose fathers had graduated from university or college were compared to those whose fathers had not done so and no significant differences were found. No comparisons were made based on maternal education because the mothers in the current sample were quite highly educated and there was little variability with respect to their educational attainment. To examine the effect of maternal occupation on children's aggression, comparisons were made between children of mothers who worked in helping professions (education and healthcare) and those who did not. No significant differences were found between groups. Finally, the effect of income on aggression was examined and no significant differences were found. The absence of effects of socio-economic variables on aggression is likely due to the fact that there was little variability in the socio-economic make up of the sample. Most of the parents who participated had fairly well-paying jobs and had received fairly high levels of educational attainment. If the sample had included people from more diverse socio-economic backgrounds, differences in aggression would be expected to be

found such that physical aggression would increase as parental education, parental occupational prestige, and income decreased, based on previous studies (e.g., Cote et al., 2007; Romano et al., 2005). In addition, relational aggression might increase with socioeconomic status because of its less obvious nature. People with better jobs and higher incomes might benefit more from being able to control and manipulate relationships without obvious hostile intentions and their children might imitate these behaviours.

Limitations and Suggestions for Future Research

Future researchers should use a wide variety of measures of aggression whenever possible since parents and teachers may underreport aggressive behaviour and since checklist data can be less informative than actual observation of data. Observational data can be extremely useful because it provides so much context and allows one to get a true picture of a child's behaviour without being biased by parents' and teachers' perspectives. Observational data can be collected in naturalistic environments by simply watching or using a video camera. In addition, having children engage in activities that are purposely set up to elicit some mild aggression can be useful. Examples include having groups of three children play with a limited number of toys (e.g., Garner et al., 2007) or having children attempt to draw using a limited number of attractive crayons (e.g., Ostrov et al., 2004). If these methods are chosen, great efforts would need to be made to ensure that children are not harmed by the experience and that they are made to feel good afterwards.

In addition, instead of asking children to choose between "mean" and "not mean," in response to ambiguous situations, it might be useful to allow children to say "I don't

know,” so that they do not arbitrarily choose one. In addition, it might be helpful to use open-ended questions like, “why do you think the child did that?” instead of having the child choose between “mean” and “not mean,” because it would require the child to pay more attention to the stories. Nevertheless, it might increase the number of I-don’t-know responses among children whose expressive language is low or who are inattentive.

It was interesting to note that children commonly responded that they would tell an adult if they were in one of the ambiguous situations. For the most part, children simply stated that they would tell an adult without specifying whether they wanted the other child to be punished. In future research, it might be interesting to query these responses by asking, “what do you think would happen next?” It would be tempting to simply ask, “why?” but this might make some children defensive. It might also be useful to use action figures and to have the children actually enact the responses that they would choose. This might help children who have difficulty imagining themselves in a particular situation.

If parent and teacher-report measures are used, it might be useful to include more items on scales like the PSBS. Additional physical aggression items could include hair-pulling and biting. Additional relational aggression items could include ignoring, saying things about other children that make them look bad, and starting a club and not letting some people be in it. Furthermore, a wider variety of distracter items might be useful so that parents and teachers are less likely to notice that the scale focuses on aggression and may be more likely to respond honestly.

Future researchers should also attempt to include a larger sample size and especially a larger number of children with poor language skills and with a lot of aggressive behaviour. In addition, every effort should be made to include data from as many teachers

as possible since they are less likely to provide socially desirable responses and may actually be more accurate than parents, at least for relational aggression. In order to recruit a more diverse sample, future researchers should use a wider array of community resources. For example, contacting people through government-funded or other free or low-cost programs might increase the likelihood of finding people from a wider array of economic backgrounds. Furthermore, some parents of aggressive children may have chosen not to participate in the study because of fears that their children would be identified as aggressive or that they would experience some social stigma. To decrease these fears, it would be beneficial to have information evenings describing the purpose of the study and reiterating the confidential nature of the data. In addition, recruiting through groups that are specifically designed to help parents who have children with behaviour problems might increase the chances of recruiting a sample that is more variable in aggression.

A longitudinal study examining changes in hostile attributions and their links to affective-perspective taking would be useful because it might help to pinpoint the age at which some children tend to choose to behave aggressively, while others choose prosocial behaviour. Furthermore, examining changes in aggressive responses to ambiguous situations and aggressive behaviour across time would help to clarify how the importance of this aspect of social-information processing changes across time.

A longitudinal follow-up study would also be useful for examining how language scores early on predict aggressive behaviour a year or two later. Future researchers might find that poor language skills might lead to the development of physical aggression due to the fact that social-information processing is verbally mediated and frustration often

results in aggression. In addition, it would be interesting to examine how the link between pragmatic language skills and physically aggressive behaviour changes over time. Finally, conducting a longitudinal study that compares the pathways of children who increase or decrease in aggression would be an important contribution to the field and would have helpful clinical applications. It would be especially interesting to compare those who are physically or relationally aggressive as preschoolers and who continue to remain aggressive as they get older, with the pathways of children who are aggressive as preschoolers, but become less aggressive or more prosocial with age.

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APPENDIX A

DEMOGRAPHICS QUESTIONNAIRE

The Canadian Psychological Association recommends that researchers report the major demographic characteristics of research participants. To assist us in collecting this information, please complete this brief questionnaire (use the back if needed). All data are confidential and will not be used in any way that identifies you or your child. If you have any questions concerning any of the items, please do not hesitate to ask them.

Child's Name _____

Today's Date _____

Child's birth date (please include day, month, and year) _____

Child's current grade _____

Child's gender _____

Your relationship to child (e.g., mother, father) _____

Parents' Marital Status

- ☐ Married, If so, for how long? _____
- ☐ Divorced
- ☐ Separated
- ☐ Living together, If so, for how long? _____
- ☐ Remarried
- ☐ None of the above (Please Specify: _____)

Who does the child live with most of the time?

- ☐ Mother
- ☐ Father
- ☐ Step-father
- ☐ Step-mother
- ☐ Other (Please Specify: _____)
- ☐

Father's education

- ☐ Less than 7 years
- ☐ Junior high school (Grade 9)
- ☐ Some high school (Grade 10 or 11)
- ☐ Graduated from high school or equivalent high school diploma
- ☐ Some college or university (at least one year)
- ☐ Graduated from college or university
- ☐ Graduate/professional school (e.g., Master's, Ph.D.)
- ☐ Other _____

Mother's education

- ☐ Less than 7 years
- ☐ Junior high school (Grade 9)
- ☐ Some high school (Grade 10 or 11)
- ☐ Graduated from high school or equivalent high school diploma
- ☐ Some college or university (at least one year)
- ☐ Graduated from college or university
- ☐ Graduate/professional school (e.g., Master's, Ph.D.)
- ☐ Other _____

Please describe stepparents' education if applicable:

Stepmother:

- ☐ Less than 7 years
- ☐ Junior high school (Grade 9)
- ☐ Some high school (Grade 10 or 11)
- ☐ Graduated from high school or equivalent high school diploma
- ☐ Some college or university (at least one year)
- ☐ Graduated from college or university
- ☐ Graduate/professional school (e.g., Master's, Ph.D.)
- ☐ Other _____

Stepfather:

- ☐ Less than 7 years
- ☐ Junior high school (Grade 9)
- ☐ Some high school (Grade 10 or 11)

- ☐ Graduated from high school or equivalent high school diploma
- ☐ Some college or university (at least one year)
- ☐ Graduated from college or university
- ☐ Graduate/professional school (e.g., Master's, Ph.D.)
- ☐ Other _____

Mother's occupation _____

Father's occupation _____

Please describe stepparents' occupations if applicable: _____

Mother's ethnicity: (please choose the one that fits best)

- ☐ South Asian
- ☐ East Asian
- ☐ Caucasian
- ☐ African Canadian
- ☐ Caribbean
- ☐ Hispanic
- ☐ Native Canadian
- ☐ Biracial - Please Specify _____
- ☐ Multi-racial - Please Specify _____
- ☐ Other – Please Specify _____

Father's ethnicity (please choose the one that fits best):

- ☐ South Asian
- ☐ East Asian
- ☐ Caucasian
- ☐ African Canadian
- ☐ Caribbean
- ☐ Hispanic
- ☐ Native Canadian
- ☐ Biracial - Please Specify _____
- ☐ Multi-racial - Please Specify _____
- ☐ Other – Please Specify _____

If applicable: Stepfather's ethnicity

- ☐ South Asian
- ☐ East Asian
- ☐ Caucasian
- ☐ African Canadian
- ☐ Caribbean
- ☐ Hispanic
- ☐ Native Canadian
- ☐ Biracial - Please Specify _____
- ☐ Multi-racial - Please Specify _____
- ☐ Other – Please Specify _____

If applicable: Stepmother's ethnicity

- ☐ South Asian
- ☐ East Asian
- ☐ Caucasian
- ☐ African Canadian
- ☐ Caribbean
- ☐ Hispanic
- ☐ Native Canadian
- ☐ Biracial - Please Specify _____
- ☐ Multi-racial - Please Specify _____
- ☐ Other – Please Specify _____

Has your child been diagnosed with a disability or a psychological disorder? _____

If so, please specify _____

Has your child been suspected of having a learning disorder?

If so, please specify _____

Do you think your child has a disorder of any kind? _____

If so, what do you think the child has? _____

Is your child receiving any psychological services? _____

If so, please describe: _____

Does your child have a serious illness? _____

If so, please specify _____

Is your child currently taking any medications? _____

If so, please specify _____

Approximate total annual income of parent(s) who live with the child

- ☐ Under \$30 000
- ☐ \$ 30 000 to \$60 000
- ☐ \$ 61 000 to \$100 000
- ☐ \$ 101 000 to \$150 000
- ☐ \$ 151 000 to \$250 000
- ☐ Over \$250 000

Does your child have any siblings? If so, please indicate gender and date of birth for each child.

How would you describe your child as an infant? (e.g., easy, difficult, slow-to-warm up)

Imagine that your child came to you and told you that another child hit your child while they were playing on the playground. What would you tell your child to do?

Imagine that your child came to you and told you that another child was telling other children not to be friends with your child. What would you tell your child to do?

Please tell us anything else that you think we should know:

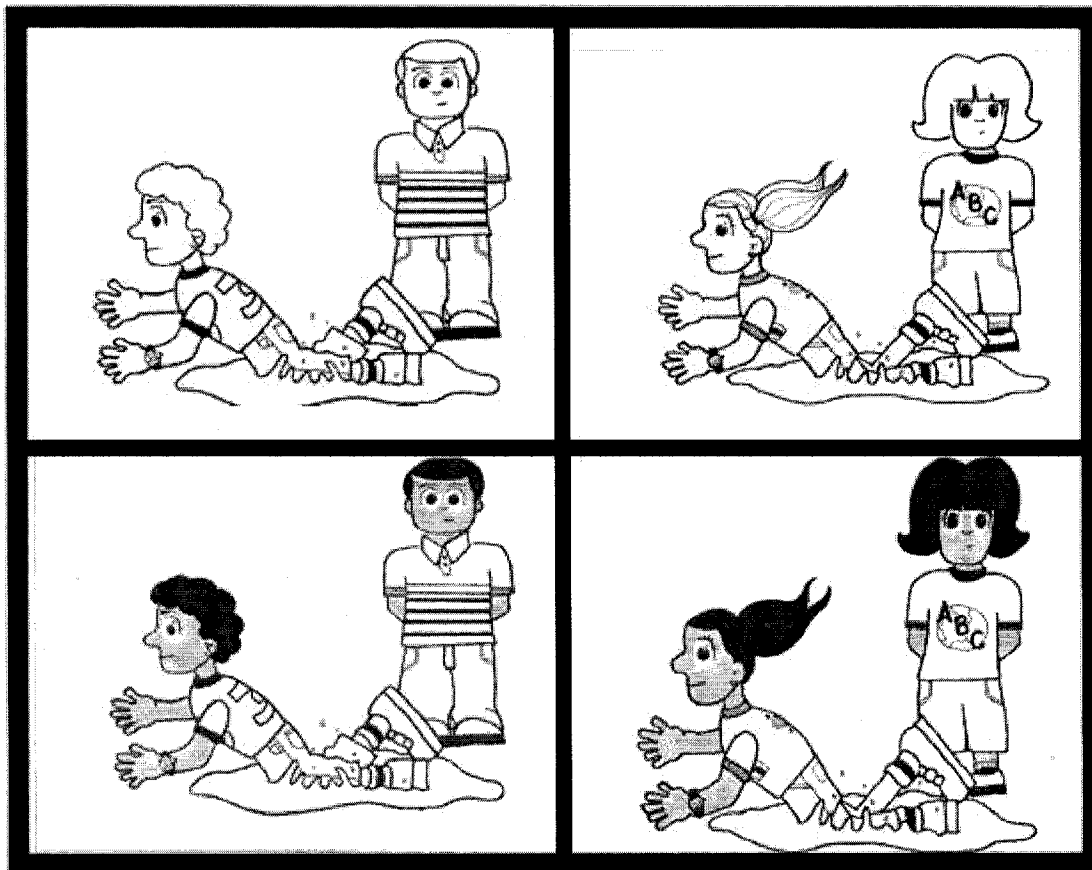
APPENDIX B

SOCIAL-INFORMATION PROCESSING STORIES

Each of the following vignettes were pre-recorded and played to the children on a laptop accompanied by the appropriate illustrations. After hearing each story, children listened to two puppets give their opinions. One said, “I think that’s mean,” and the other puppet said, “I don’t think that’s mean.” Children were asked to point to the puppet with whom he or she agreed. Next, the children were asked, “What would you do if this happened to you?” Follow-up to this task is presented in Appendix D. The illustrations were drawn by Anthony McKenzie. Children were presented with one image each per story. The images that best matched the skin colour and gender of the given child were used.

The Shoes Story, Race Story, Standing Story, Playground Story, Party Story, and Puzzle Story were adapted from stories written by Crick et al. (2002; Crick, personal correspondence, 2008) and The Tag Story and The Colouring story were written by the current author.

Physical Situations

*Illustration 1. Shoes Story*

Pretend that you are playing outside and you're wearing new shoes. You really like your new shoes and this is the first day you have worn them. Suddenly, you are bumped from behind by another kid. You fall into a mud puddle and hurt your knee and your new shoes get muddy.

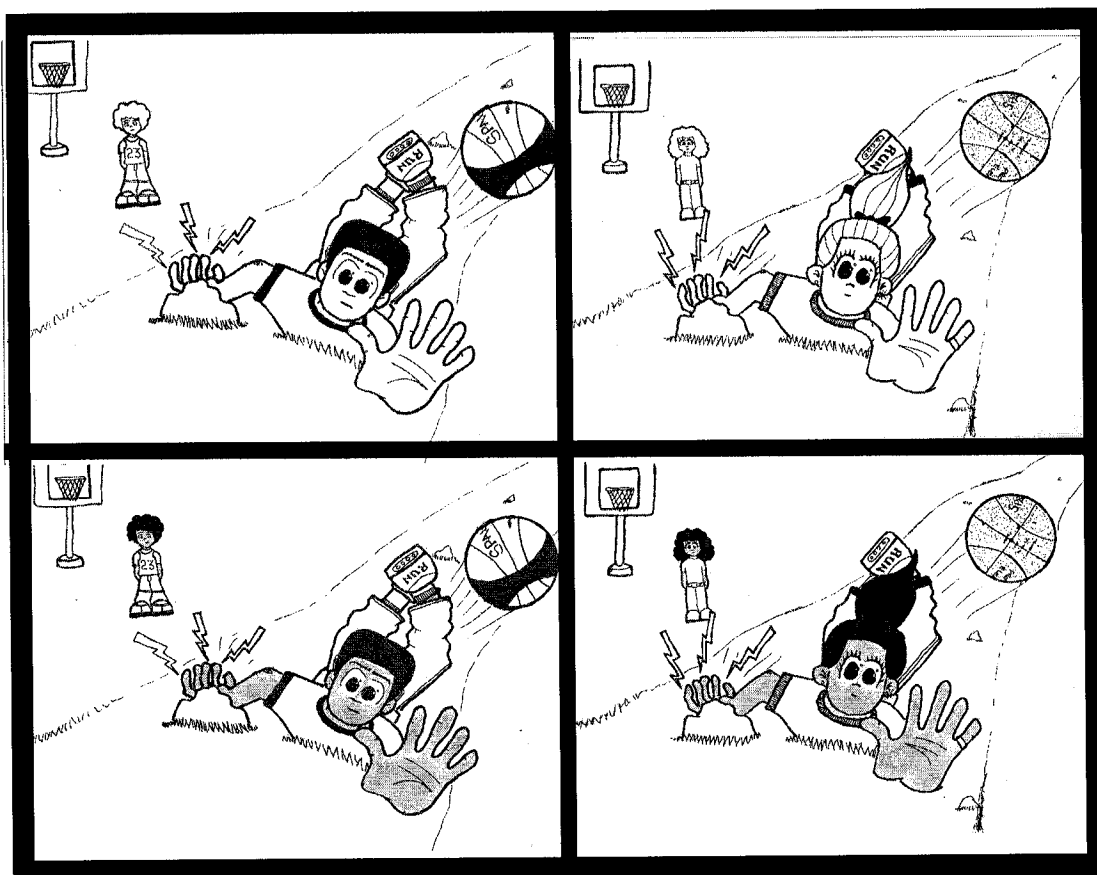


Illustration 2. Race Story

Pretend that you are on the playground. You and some other kids are having a race. Another kid is standing on the side, bouncing a basketball. The next thing you know is that the kid has bounced the ball and it rolls under your feet. It makes you fall. You hurt your hand and someone else wins the race.

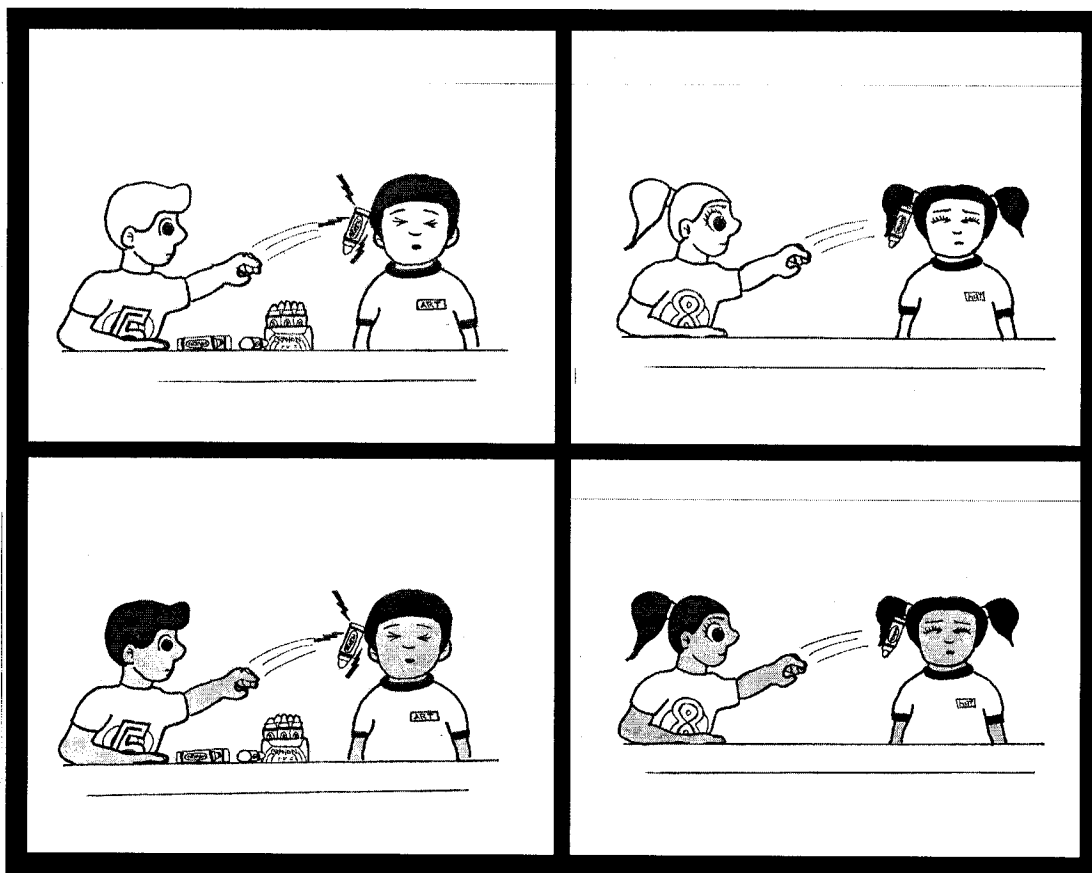


Illustration 3, Colouring Story

Pretend that you are at school colouring a picture. You want to use the red crayon. You ask a kid, "could you pass me the red?" The kid throws the red crayon toward you. It hits your head and it hurts.

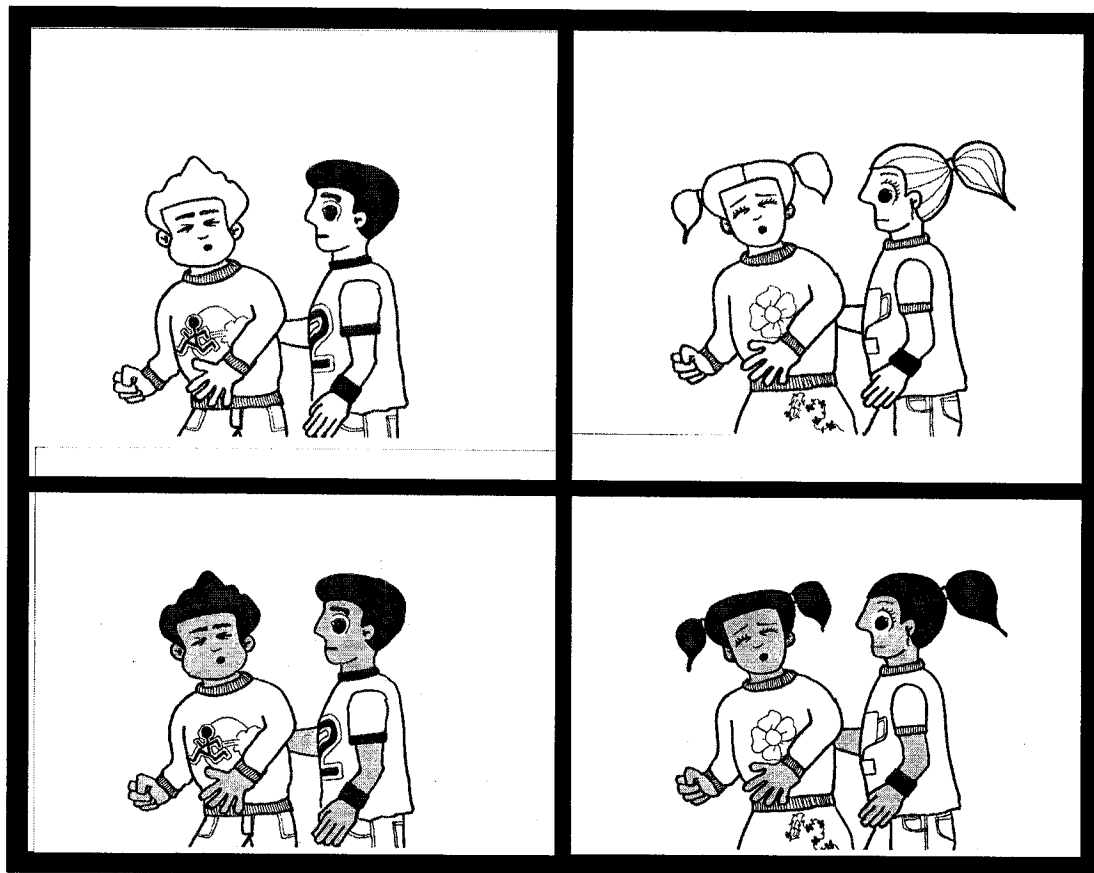


Illustration 4. Tag Story

Pretend that you are on the playground playing tag. You are running away from the kid who is it. The kid who is it comes up and hits you hard and says “you’re it!” It hurts.

Relational Situations

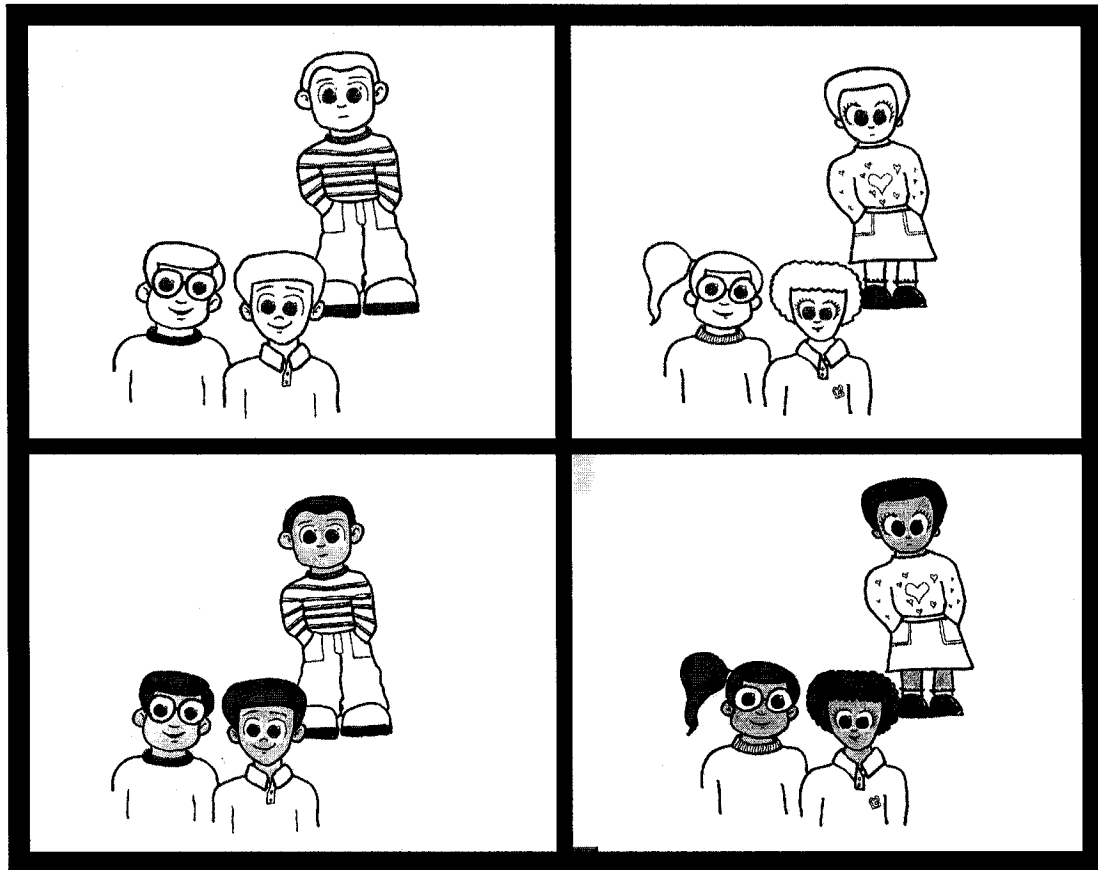


Illustration 5. Standing Story

Pretend that you are standing in the hallway one morning at school. As you are standing there, two kids from your class walk by. As they walk by you, the two kids look at you, whisper something to each other, and then they laugh.

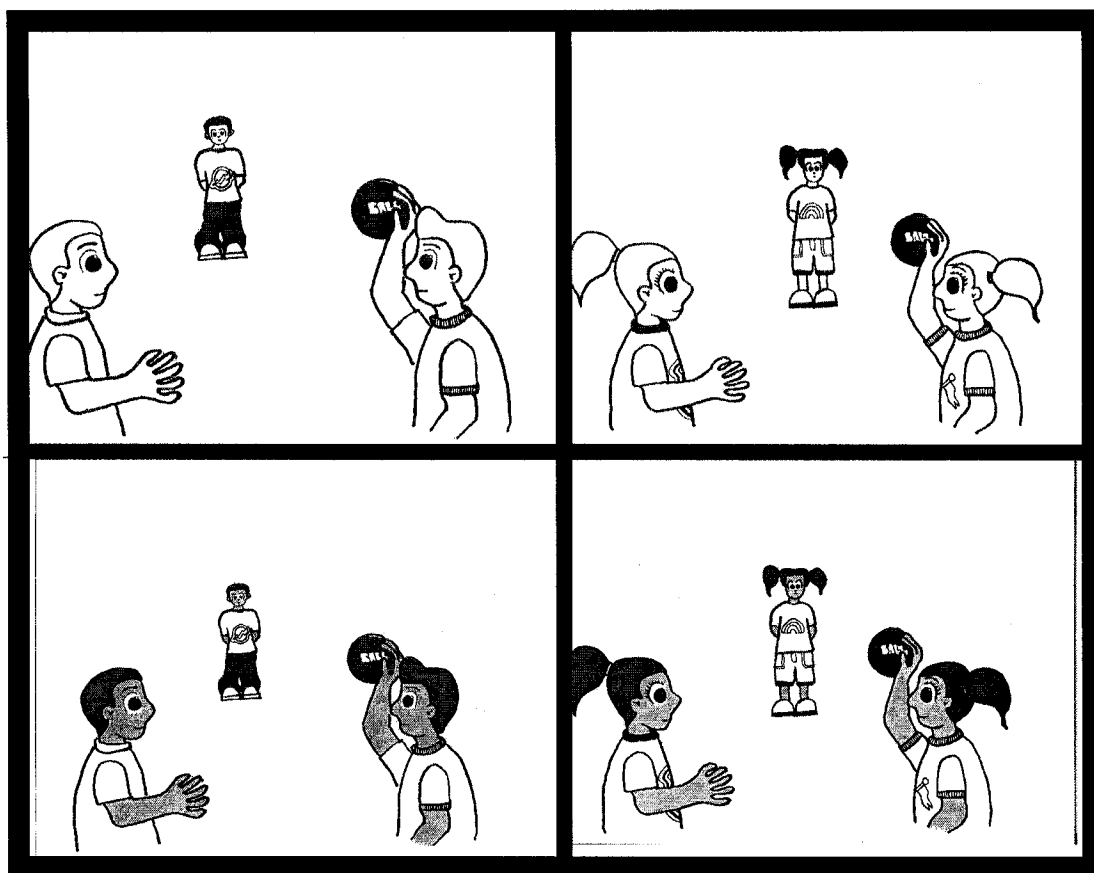


Illustration 6. Playground Story

Pretend that your friend asked you to wait by the swings so that you could play together. You wait by the swings, but your friend is not there. You look for your friend on the playground for a while. By the time you find your friend, your friend is already playing with someone else—a kid that you don't like very much.

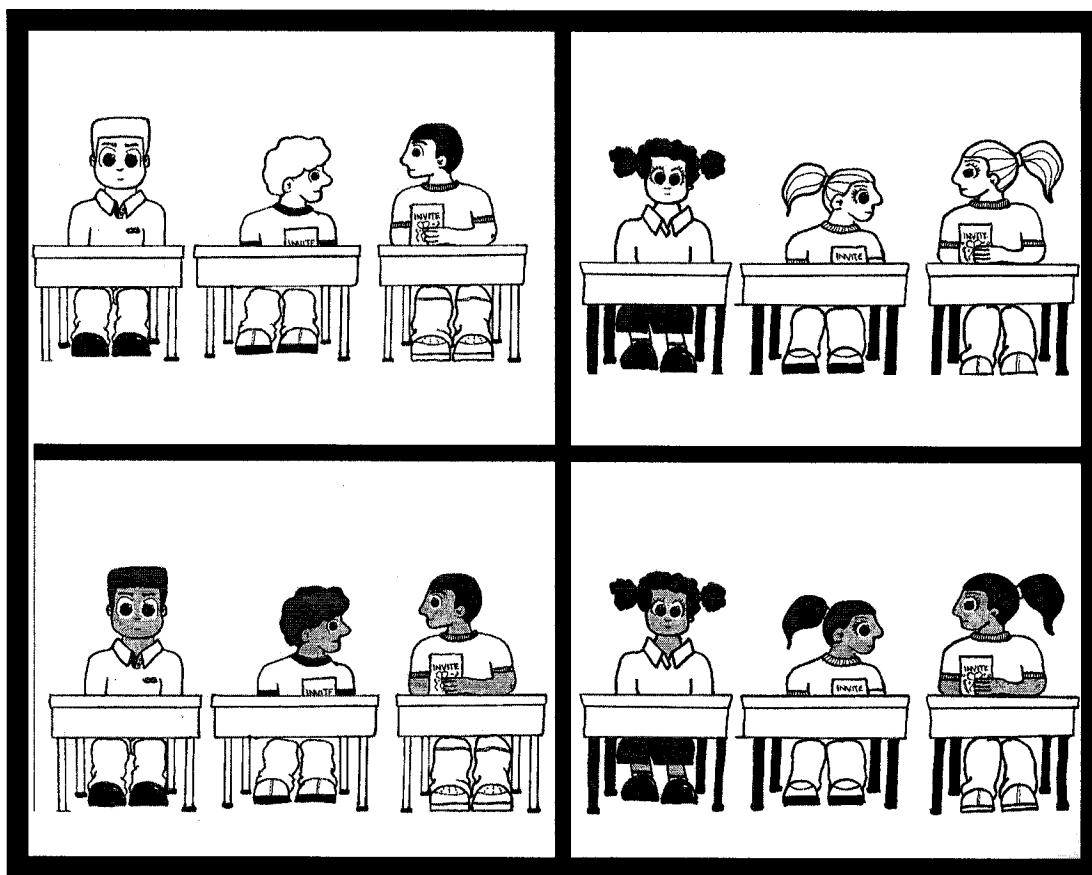


Illustration 7. Party Story

Pretend that you are at school one day. Two other kids from your class start talking to each other. You hear one of the kids invite the other one to a birthday party. The kid says that there are going to be a lot of people at the party. You have not been invited to this party.

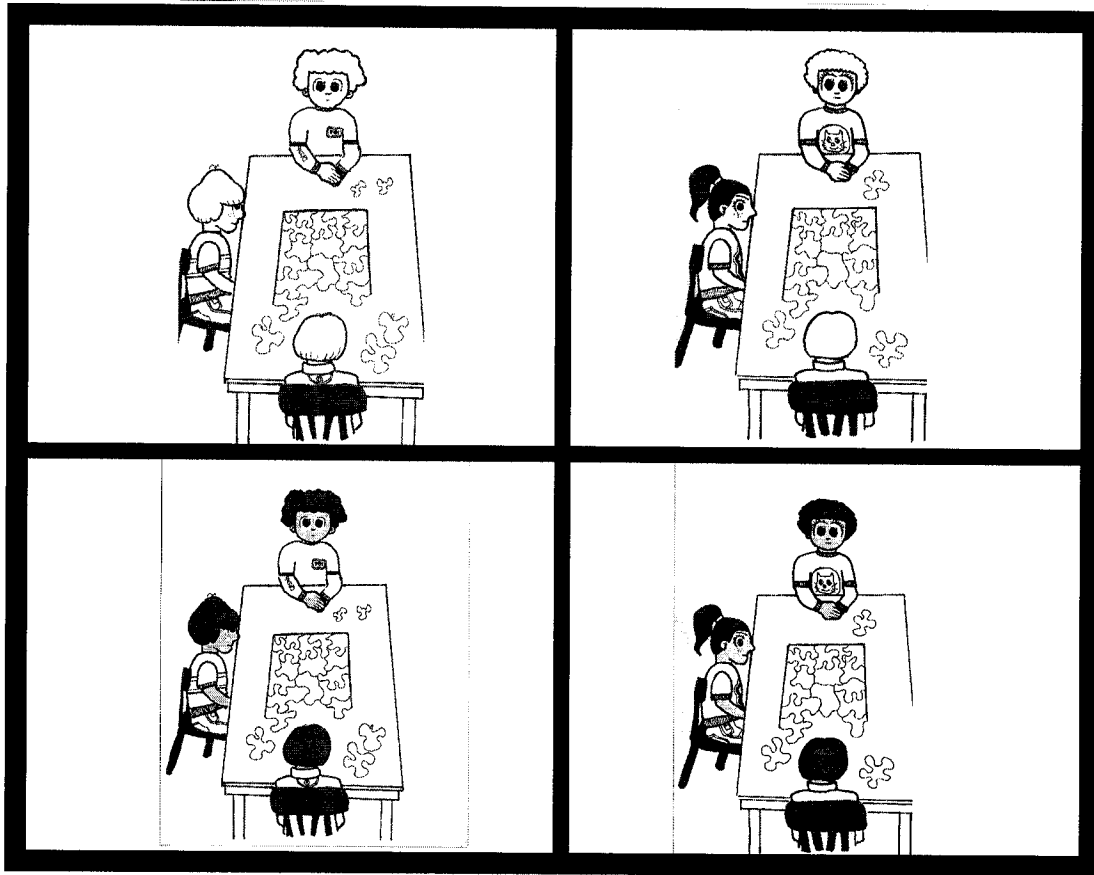


Illustration 8. Puzzle Story

Pretend that you are at school. Some kids are sitting together doing a puzzle. You are looking for a place to sit. The kids are laughing and talking to each other and they look like they are having a good time. You walk over to their table. As soon as you sit down, the kids stop talking and no one says anything to you.

APPENDIX C

SOCIAL-INFORMATION PROCESSING FORCED-CHOICE RESPONSE OPTIONS

If the child said, “I don’t know,” when asked what he/she would do in any given story, this was noted and the rest of the stories were presented as usual. After going through all of the stories once, the examiner returned to the stories to which the child said “I don’t know.” Those stories were played again and after each story, the child was presented with 4 options of what might be done and was asked to decide which he or she would choose. The options that correspond to each story are presented below.

Shoes Story

- a) push that kid in the mud
- b) yell “you’re not coming to my birthday party!”
- c) ask the kid to play with you
- d) do nothing

Race Story

- a) throw the ball at the kid’s head
- b) ask the kid to join the race
- c) do nothing
- d) tell the other kids not to talk to that kid

Colouring Story

- a) do nothing
- b) Say, “Ouch, that hurts, please be careful.”
- c) Throw the crayon back at the kid
- d) Say, “you’re not my friend anymore!”

Tag Story

- a) stop talking to the kid for the rest of the day

- b) punch the kid in the stomach
- c) keep playing the game
- d) do nothing

Standing Story

- a) do nothing
- b) say, "you are not my friends!"
- c) push the kids
- d) tell a joke

Playground Story

- a) throw rocks at them
- b) say, "can I play, too?"
- c) do nothing
- d) say, "I don't like you!"

Party Story

- a) have your own party and invite everyone
- b) kick the kids
- c) say, "Your parties are stupid!"
- d) do nothing

Hallway Story

- a) do nothing
- b) pinch the kids
- c) say "hi" to the kids
- d) Say, "I don't want to play with you!"

APPENDIX D

GUIDELINES FOR CODING RESPONSES TO AMBIGUOUS STORIES

- 1) Physical aggression – intentionally causing any type of physical harm or attempting to cause physical harm
- 2) Relational aggression – threatening or manipulating relationships – including name calling, refusing to speak or play with a child, threatening or leaving others out, telling other children not to play with a child, ignoring (if it is obvious and intended to harm the other person), anything that seems intended to damage a relationship, friendship, or reputation
- 3) Aggressive but not relational or physical – aggressive behaviour that does not fall into the previous 2 categories (e.g., destruction of property, threats of physical harm) – any behaviour intended to cause harm, but the nature of the harm is not physical or relational
- 4) Prosocial – behaviour aimed at maintaining relationships and/or the wellbeing of society, asking for help, asking to be included. Asking someone not to do something that is bothersome would go in this category as long as it does not include name-calling
- 5) Adult involvement* – Mentioning that an adult (e.g., parent or teacher) will be told without mentioning any punishment that might result
- 6) Other: This includes “I don’t know,” “nothing” (if left unprompted), “I would cry,” “I would feel sad,” and any response that does not fit into another category
- 7) Prompted Physical
- 8) Prompted Relational
- 9) Prompted Prosocial
- 10) Prompted Do nothing
- 11) Threatening Adult Physical Punishment* - threatening to tell an adult and mentioning some type of physical punishment that will result
- 12) Threatening Adult Non Physical Punishment* – threatening to tell an adult and mentioning some type of non-physical punishment that will result (e.g., timeout)
- 13) Withdrawal or go away – leaving the scene by going home or just walking away (one has to actually be in a social situation in order to withdraw from it)

*In the event that a child says he/she would involve an adult, but also states that he/she would do something directly to the child, code the child’s response that most involves his/her interaction with the peers (e.g., if a child says “I would tell the teacher and hit him,” code this as physical aggression rather than adult involvement)

APPENDIX E PRESCHOOL SOCIAL BEHAVIOUR SCALE

Preschool Social Behavior Scale

Child's Name _____ Parent's Name _____	Child's sex: Male or Female? Age _____
---	---

	Never or almost almost never true true	not often	some times	often	always or always
1. This child is good at sharing and taking turns	1	2	3	4	5
2. This child kicks or hits others.	1	2	3	4	5
3. This child is helpful to peers.	1	2	3	4	5
4. This child tells a peer that he/she won't play with that peer or be that peer's friend unless he/she does what this child asks.	1	2	3	4	5
5. This child verbally threatens to hit or beat up other children.	1	2	3	4	5
6. This child is kind to peers.	1	2	3	4	5
7. This child pushes or shoves other children.	1	2	3	4	5
8. This child tells others not to play with or be a peer's friend.	1	2	3	4	5
9. This child doesn't have much fun.	1	2	3	4	5
10. This child says or does nice things for other kids.	1	2	3	4	5
11. When mad at a peer, this child keeps that peer from being in the play group.	1	2	3	4	5
12. This child verbally threatens to physically harm another peer in order to get what they want.	1	2	3	4	5
13. This child tries to embarrass peers by making fun of them in front of other children.	1	2	3	4	5
14. This child ruins other peer's things (e.g. art projects, toys) when he/she is upset.	1	2	3	4	5

15. This child tells a peer they won't be invited to their birthday party unless he/she does what the child wants.	1	2	3	4	5
16. This child looks sad.	1	2	3	4	5
17. This child throws things at others when he/she doesn't get his/her own way.	1	2	3	4	5
18. This child smiles at other kids.	1	2	3	4	5
19. This child walks away or turns his/her back when he/she is mad at another peer.	1	2	3	4	5
20. This child verbally threatens to push a peer off a toy (e.g. tricycle, play horse) or ruin what the peer is working on (e.g. building blocks) unless that peer shares.	1	2	3	4	5
21. This child tries to get others to dislike a peer (e.g. by whispering mean things about the peer behind the peer's back).	1	2	3	4	5
22. This child verbally threatens to keep a peer out of the play group if the peer doesn't do what the child says.	1	2	3	4	5
23. This child hurts other children by pinching them.	1	2	3	4	5
24. This child is well liked by peers of the <u>same</u> sex.	1	2	3	4	5
25. This child is well liked by peers of the <u>opposite</u> sex.	1	2	3	4	5
26. This child punches peers.	1	2	3	4	5
27. This child pokes peers.	1	2	3	4	5

The items from this measure have been published in Crick, Casas, & Mosher (1997).

Scales used in the current study are as follows:

Physical Aggression: 2, 5, 7, 17, 23, 26, 27

Relational Aggression: 4, 8, 11, 13, 15, 19, 21, 22

Total Aggression: 2, 4, 5, 7, 8, 11, 12, 13, 14, 15, 17, 19, 20, 21, 22, 23, 26, 27

Prosocial Behavior: 1, 3, 6, 10

Depressed Affect: 9, 16, 18 (this item is reverse coded)

Child's acceptance with same sex peers: 24

Child's acceptance with opposite sex peer: 25

APPENDIX F
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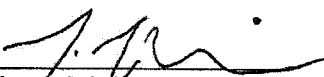
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I give permission to reprint the following in Sara O'Neil's thesis:

32 black and white illustrations of children in social situations to accompany the ambiguous stories used in this thesis

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Signed


Anthony McKenzie

Sept 6. 2008
Date

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To: Sara O'Neil <seonl@mta.ca>
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Peter Ralston
 Coordinator -- Crick Social Development Lab
 Coordinator -- Center On Relational Aggression
 Institute of Child Development
 University of Minnesota

Sara O'Neil wrote:

> August 25, 2008
 > Sara O'Neil
 > Psychology Department
 > University of Windsor
 > 401 Sunset Ave
 > Windsor, ON
 > N9B 1E6
 >
 > Dear Dr. Crick:
 >
 > I am completing a Master's thesis at the University of Windsor entitled
 > "Predicting Young Children's Physical and Relational Aggression from Their
 > Social-Information Processing, Affective-Perspective Taking Ability, and
 > Language Skills." I really appreciate you having sent me some of your ambiguous
 > vignettes via Peter Ralston and I would like your permission to reprint in my
 > thesis six of the vignettes that you have emailed me and that were described in
 > Crick, N. R., Grotpeter, J. K., Bigbee, M. A. (2002). Relationally and
 > Physically Aggressive Children's Intent Attributions and Feelings of Distress
 > for Relational and Instrument Peer Provocations. Child Development, 73(4),
 > 1134-1142.
 > The vignettes that I would like to reproduce are: Shoes Story, Race Story,
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 > Thank you very much for your time and any help you can give me with this.
 >
 > Sincerely,
 >
 > Sara O'Neil
 >

Vita Auctoris

Sara O'Neil was born January 29, 1982 in Halifax, Nova Scotia. She graduated from Halifax West High School in 2000. From there, she went to Mount Allison University in Sackville, New Brunswick and graduated with an Honours Bachelor of Arts in Psychology in 2005. She is currently enrolled in her third year of the Clinical Child Psychology program at the University of Windsor and will receive her Master's degree in Fall 2008.